

# TABLE OF CONTENTS

## ***DENTAL ITEMS OF SIGNIFICANCE 64*** **January 2002**

### ***QUESTIONS & ANSWERS***

- 64-01 Using Two Types of Amalgam for One Restoration
- 64-02 Installation of Wall-Mounted X-Ray Units in Dental Treatment Rooms
- 64-03 Post-treatment Sensitivity and Self-etching Primers
- 64-04 Making Dentistry More Colorful
- 64-05 How Should I Select a New Brand of Amalgam?
- 64-06 The Latest on the Impression Material Front
- 64-07 Where Are Compomers Best Indicated for Use?
- 64-08 The New Prompt L-Pop
- 64-09 Pregnancy and Working with Hazardous Chemicals in the Dental Clinic
- 64-10 How Do I Properly Dispose of the Plastic "Bladders" Found Inside Some Amalgam Capsules?

### ***WHAT'S NEW?***

Cavitron Select SPS Ultrasonic Scaler  
Resilience  
QUIKGlaze  
Disclose Dry Handle Swabs  
Twist2it Disposable Prophylaxis Angle  
Quell  
McBinn Sharpening Stone  
White Shield Safety Saliva Ejector  
STEAM*Plus* Steam Sterilization Integrator  
Tetric Ceram HB  
StatStone  
Helioseal Clear Chroma  
Open Wide Disposable Mouth Prop  
TwinBrush  
Open Wide Wraparound Mouth Prop and Open Wide Tab Mouth Prop  
Astralis 7  
Astralis 10  
Coltosol  
Revotek LC

Systemp.desensitizer  
Pro Blend Mixer  
Bistite II DC

## ***FROM THE LITERATURE***

Percutaneous Injuries in Dentistry  
Is Digital Radiography Better than Using Conventional Film?  
Do Continuous-treatment Biocides Affect Enamel Bond Strengths?  
Does a “Shock-absorbing” Adhesive Really Perform Better?  
Panoramic Radiographs Can Facilitate Screening for Stroke  
Self-cured Composites Bonded with Light-cured Adhesives: Be Careful!  
10-year Clinical Performance of a Hybrid Resin Composite  
Dental Unit Waterline Study  
The Old Question: How Moist Should Dentin Be for Bonding?  
Does the Type of Resin-based Cement Really Matter?  
Does Nightguard Vital Bleaching Affect Bonding?  
Selecting a Shade for Resin-modified Glass Ionomers  
Which Bonding Agents Bond Better: the Simplified or the Multi-step?

## ***GENERAL DENTISTRY***

64-11 Illusion Universal Cementation System  
64-12 QUATTROcare  
64-13 LumaCure Cordless Curing Light  
64-14 Accu-Dent System 1 Impression System  
64-15 Accu-Dent System 2 Impression System  
64-16 Irix 70-C Mobile X-ray Unit  
64-17 Heliomolar HB Resin Composite  
64-18 Touch & Bond  
64-19 Hawe PerioStar 3000  
64-20 Heliodont DS Mobile X-ray Unit  
64-21 Midmark/Ritter 354 Minor Surgery Spotlight  
64-22 Synopsis of Recently Evaluated One-Step Self-Etching Dentin Bonding Agents  
64-23 VersaLux Cordless Curing Light  
64-24 Bingo-1020 Apex Locator

## ***LABORATORY***

64-25 Talon Acrylic  
64-26 Impak Acrylic

- 64-27 Easy Tray
- 64-28 Synopsis of Steam Cleaners

## ***INFECTION CONTROL***

- 64-29 LARK Retractable Safety Scalpel

# QUESTIONS & ANSWERS

"Questions & Answers" is a feature in which we present and answer the questions we most frequently receive from the field. This month we feature questions about wall-mounting an x-ray unit, selecting a brand of amalgam, and the proper procedures for pregnant women who work around hazardous chemicals. Should you want more information about a particular topic, please contact the individual whose name follows the specific answer in which you are interested. If you have a question about a topic not discussed in this issue, feel free to call DIS at DSN 240-3502.

## 64-01 Using Two Types of Amalgam for One Restoration

**Question:** What is your opinion about mixing different types of amalgams like and admix and a spherical? My specific question is whether or not it's okay to use a faster-setting spherical like Tytin for the bottom part of a chamber-retained buildup and a slower-setting admixed amalgam like Valiant Phd for the top portion to give more time for carving?

**Answer:** One of the most important differences between the various types of amalgam is their handling characteristics. For example, single-composition-spherical (SCS) amalgams like Tytin (SDS/Kerr), Megalloy (Dentsply/Caulk), and Logic + (Southern Dental Industries) are characterized by being harder, stronger in compression, and faster setting than admixed ones like Dispersalloy (Dentsply/Caulk), Valiant PhD (Ivoclar Vivadent), and Original D (Wykle Research). An alloy that becomes harder faster can more effectively be used in retentive features such as amalgapin preparations, peripheral shelves, grooves, and slots. Placing a slower-setting admixed amalgam over the SCS can provide you with additional carving time for incorporating proper anatomy and contours. You can maximize these advantages by selecting the faster-setting version of a SCS amalgam (usually called fast-set) and the slower-setting version of an admixed amalgam (usually called regular-set or possibly slow-set). This will provide maximum early retention of the restoration coupled with extended carving time. Laboratory studies appears to support this type of technique because they indicate that the strength of a combination of two types of amalgam is not statistically different from that of a single type.<sup>1,2</sup> Also, research has shown that the resistance to early dislodgment of an amalgapin-retained complex amalgam is greater when using the SCS Tytin or a combination of Tytin and the admixed Dispersalloy than when using Dispersalloy alone.<sup>3</sup> Importantly, the same study found no evidence of delamination during testing. This appears to be a viable and useful procedure when placing complex amalgams, especially when using amalgapin features for retention/resistance.

(Col Charlton)

### References

1. Gordon M, Liberman R, Ben-Amar A, Eldar S. Joint strength between two layers of different amalgam types condensed successfully. *J Oral Rehabil* 1989;16:437-440.
  2. Overton JD, Long TE, Pruette RL. Combination of a rapid and slow set amalgam for large restorations [Abstract]. *J Dent Res* 1995;74:102.
  3. Schulte GA, Hermes CB, Vandewalle KS, Buikema DJ. Early fracture resistance of amalgapin-retained complex amalgam restorations. *Oper Dent* 1998;23:108-112.
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## 64-02 Installation of Wall-Mounted X-Ray Units in Dental Treatment Rooms

**Question:** Our clinic would like to install a wall-mounted x-ray unit in one of our treatment rooms. Is additional shielding required and are there any special electrical requirements?

**Answer:** Several factors have to be taken into account when considering the installation of a wall-mounted unit. Two important ones are radiation shielding and electrical requirements.

### Radiation Shielding

Radiation protection involves the patient, the operator, and other personnel in the area. Patient exposure is minimized through methods such as filtration, collimation, cone length, film speed, lead aprons, etc. The operator, on the other hand, is protected by the position and distance rule. This rule states that the operator should stand at least 6 feet away from the patient and in a safe quadrant at an angle between 90 and 135 degrees to the primary beam. The main purpose of shielding is to protect other personnel in the area from the primary beam as well as to protect the operator if he cannot position himself in a safe quadrant as described above.

The primary factors that determine the need for shielding in a dental treatment room (DTR) are: 1) the radiograph workload, 2) the direction of the primary beam and whether there are personnel in its path, 3) the distance of personnel from the x-ray source, and 4) whether the adjacent rooms are considered controlled or uncontrolled areas (i.e., does the public have access to the rooms unescorted by dental staff). Gypsum wallboard, as found in most dental facilities, provides some level of protection to personnel in adjacent rooms. The need for additional shielding, (e.g., lead lining) in a given circumstance will depend on your answers to the above-listed variables. Because these variables can differ from facility to facility, Bioenvironmental Engineering should be contacted to perform a survey to determine the need for additional shielding prior to installation of an x-ray unit in a DTR. Most surveys will show that typical gypsum wall construction will provide adequate shielding for low usage levels.

At one time, a reference in Air Force Instruction 47-101 established 255 films/week as the maximum number of x-rays allowed in unshielded dental treatment rooms. Maximum permissible doses have since changed, and that number is no longer valid. Once again, due to variations in design from facility to facility, Bioenvironmental Engineering should be consulted when determining the need for additional shielding.

### Electrical Considerations

While x-ray units do not require a great deal of electricity and usually run on 120 volts, they do require a dedicated electrical line. This is because there is a surge created when an exposure is made. If there are other loads on the line, the required power may not be available when the exposure is made and this can result in a light film. It is important, therefore, to verify that the electrical circuit box in the area has the capacity remaining for a new dedicated line before you proceed.

(Col Browning)

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## 64-03 Post-treatment Sensitivity and Self-etching Primers

**Question:** I was involved in one of the recent DIS product evaluations where we used Clearfil SE Bond from the Kuraray company. We were struck by the fact that patients reported having no post-treatment pain after we placed posterior composites using that bonding agent. Is Clearfil SE Bond known for this?

**Answer:** DIS recently completed evaluations of Clearfil SE Bond (Kuraray) as well as Prompt L-Pop (3M ESPE), One-Up Bond F (Tokuyama/J. Morita), and Touch & Bond (Parkell) dentin bonding agents (DBAs). For all these products, users reported that many of their patients were pain-free following treatment. Even patients who commonly experienced sensitivity following the use of other bonding agents were comfortable.

What these bonding products have in common is that they use self-etching primers: that is, the etchant and the primer are in one liquid. Most of these products are simple to use and very fast to apply because what was previously two separate steps (etching and priming) has now become one. Some of the self-etching primer DBAs such as Prompt L-Pop, One-Up Bond F, and Touch & Bond use one liquid for the whole bonding procedure. Others like as Clearfil SE Bond and Clearfil Liner Bond 2V (Kuraray) have two liquids (the self-etching primer and the bonding resin). Regardless of the number of liquids they use, an interesting finding has been reported for these products, which is that the incidence of post-treatment sensitivity has decreased.

There are several theories as to why this is the case. The first is that the pH of these self-etching liquids is higher than that of the total etchants used with other bonding products. For example, the self-etching primers in Clearfil SE Bond and Clearfil Liner Bond 2V have pH values of 2.0 and 2.8, respectively. Phosphoric acid total etchants, on the other hand, often have a pH of about 1.0; some are even lower. While this doesn't sound like a big difference, it means that the self-etching primers are more mild and do not etch dentin as deeply. This, in turn, leads to the second reason some researchers believe there is less sensitivity. Since the etched, demineralized dentin is relatively shallow, it is easier for the resins in the DBA to infiltrate it and seal the tooth structure. While they don't form as thick a hybrid layer as total-etch DBAs, these products have generally exhibited good bond strengths in the DIS laboratory. The last reason why post-treatment sensitivity is reduced is because, unlike total-etch products, self-etching DBAs do not call for rinsing and drying the dentin after they have been placed. Some people believe that having remnants of the smear layer on the dentin surface helps provide an extra protective layer which may help reduce post-treatment pain. Some or all of these factors may contribute to less sensitivity. As clinicians, we can further reduce the possibility of post-treatment pain by placing the self-etching DBAs properly. This includes ensuring that the treatment area is well isolated and applying the DBAs exactly as their manufacturers recommend. Post-treatment pain is unpleasant for patients and frustrating for dentists, so these products are a welcome addition to our materials armamentarium.

(Col Charlton)

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## 64-04 Making Dentistry More Colorful

**Question:** I read the DIS evaluation of One-Up Bond F, the new bonding product distributed by J. Morita. Its color-changing property sounds like a good idea. Are there any other products that use this idea?

**Answer:** One-Up Bond F is the first product DIS has evaluated that uses color changes to assist clinicians in placement. To review, One-Up Bond F (DIS 62-14) is one of the new "single-application" bonding products. That means that it etches, primes, and bonds with one solution. To make the solution, however, you mix a drop from Bottle A with a drop from Bottle B. This is where the color-change chemistry comes into play. After proper mixing, the solution becomes pink which serves as an indicator to the assistant or dentist that he/she has mixed the liquids thoroughly together. The pink color also makes it easy to check that the product is being applied to the intended areas of the tooth. Now, a second color change comes into play. When you light activate the bonding agent, the pink liquid becomes nearly colorless: this serves as a reminder that you have properly light activated it. During our evaluation, clinical users found these color changes to be helpful.

Other manufacturers are incorporating this type of chemistry into their products. Two recently introduced products that DIS is evaluating are sealants called Clinpro (3M ESPE) and Helioseal Clear Chroma (Ivoclar Vivadent). Clinpro is pink when it is expressed out of its dispensing syringe. 3M ESPE claims this makes it easy to see exactly where it is being placed. It then turns white when light activated. Helioseal Clear Chroma uses almost a reverse concept, because it is clear after being placed and light activated and only undergoes a color change (to green) when it is again exposed to a light curing unit. The color change is temporary and is purported to make it easier for clinicians to assess retention and completeness of coverage at future appointments.

DIS expects that other products will be marketed in the near future that use color-changing components in similar ways to assist clinicians in their proper application. Please read the evaluations of Clinpro and Helioseal Clear Chroma when they are published in a future issue of *Dental Items of Significance*.

(Col Charlton)

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## 64-05 How Should I Select a New Brand of Amalgam?

**Question:** A number of the dentists in our clinic are complaining about the amalgam we are using so we want to buy a new brand. What are the important properties we should look at before we make up our minds?

**Answer:** Your question is a good one because some of the factors that were considered important years ago are no longer good ones on which to base a decision. Before we discuss those, however, I should mention what the single most important information is that you can have. That's how well the product has performed in long-term clinical studies. Unfortunately, unless the amalgam brand has been on the market for at least 3 to 5 years, few if any clinical studies will be available for review. So we have to turn to factors such as physical properties. This is where it is important to note that things have changed over the years. For example, the strength of an amalgam after it sets isn't as good a selection criterion as it once was because all brands marketed today are strong enough to resist the normal forces encountered in the oral cavity. Likewise creep rate, which can be a predictor of the degree to which an amalgam will undergo marginal "ditching" or breakdown, used to be helpful in selecting a brand of amalgam. Since the advent of the high-copper amalgams, however, creep rates are so low that they are no longer a good discriminator when comparing brands.

So, if strength and creep rate are no longer useful factors, what are some characteristics or properties that should be examined before buying a new type of amalgam? Well, one of the most important is the specific type of amalgam the brand is. The four types of amalgam, based on the shape(s) of the alloy particles they contain, are: single-composition lathe cut (SCL), single-composition spherical (SCS), admixture of lathe-cut with spherical silver-copper eutectic particles, and admixture of lathe-cut with single-composition-spherical particles. Why is this important? It's important because the shape of the particles in an amalgam greatly affect its handling characteristics. For example, SCS amalgams (e.g., Tytin, Megalloy, Valiant, Logic+) are easy to condense, get harder faster, and are smoother to carve, burnish and polish than the other three types. Unfortunately, though, they are more difficult to establish solid proximal contacts with. SCL amalgams, on the other hand, have the opposite advantages and disadvantages. Lastly, admixed amalgams (e.g., Dispersalloy, Original D, Permite C, GS 80, Indisperse, Valiant Ph.D.) have the advantages of the SCS amalgams and can be used pretty effectively to establish acceptable proximal contacts. Another good selection factor is cost. Conserving our limited budgets is wise and a significant amount of money can be saved if you can find an acceptable amalgam at an attractive price.

DIS can be a useful source of information about amalgam, particularly some of the more recently introduced products. Over the years we have evaluated such products as Valiant Snap-Set (Ivoclar Vivadent), Megalloy (Dentsply/Caulk), Original D (Wykle Research), Logic+ (Southern Dental Industries), Tytin FC (SDS/Kerr), Permite C (Southern Dental Industries), GS 80 (Southern Dental Industries), and Indisperse (Indisperse Distributing). In previous issues of *Dental Items of Significance* we have also discussed a number of amalgam-related topics including a way of determining the correct mixing time for amalgam, possible mercury contamination of amalgamators, and the amalgam bonding procedure. If you have questions about amalgam or need more help in selecting a specific brand, please contact DIS.

(Col Charlton)

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## 64-06 The Latest on the Impression Material Front

**Question:** Is there anything new in impression materials, either in products or how they're used?

**Answer:** I think that a lot of clinicians are under the impression (pun intended) that the kinds of materials we now have for making final impressions are tried and true and that manufacturers, as a whole, are not expending much effort or time in developing new products. Part of that view is correct: since the introduction of addition silicone materials (i.e., polyvinyl siloxanes), we have had a superb type of impression material that works extremely well. The addition silicones are very dimensionally stable, capture fine detail extremely well, have excellent working and setting times, and exhibit good tear strength. These are critically important factors for a final impression material. Some time-tested addition silicones include President (Coltene/Whaledent), Reprosil (Dentsply/Caulk), Express and Imprint II (3M ESPE), Correct VPS (Jeneric/Pentron), and Cinch Platinum (Parkell). Manufacturers have not rested on their laurels, though. They have been active in tweaking these well-performing products in an attempt to make them better and more user friendly. For example, within the last few years they have modified the composition of some addition silicones to improve their wettability. Because they are purported to be more hydrophilic, they tend to wet the prepared tooth or teeth better and flow around the critical marginal areas more easily. DIS has confirmed in its evaluations that several of these products are better for capturing detail in areas where absolute and total moisture control is difficult to achieve. Two of these more hydrophilic products are Aquasil (Dentsply/Caulk, see *DIS* 49-20) and Take 1 (SDS/Kerr, see *DIS* 59-11). Heraeus Kulzer also markets a hydrophilic product called Affinis.

Another improvement that manufacturers have made is to make the impression material's setting sensitive to intraoral temperatures. This means that the impression begins to polymerize once it is inserted in the mouth. As a result, you can use as little or as much of the material's working time to mix and place it as you choose and know that, regardless, it will set in only a couple of minutes after the tray is seated. One product with this property that DIS evaluated is Flexitime from Heraeus Kulzer (see *DIS* 63-20). Some clinicians in our evaluation really appreciated the material's temperature-sensitive setting time.

Manufacturers have also been active in developing better ways to mix and express the addition silicones. One of the first was 3M ESPE which marketed the Pentamix (and now Pentamix 2, see *DIS* 59-15). This device is an electrically-powered, cartridge-based machine that mixes and dispenses impression materials at the push of a button. A range of addition silicone brands are now available from the company for use in the Pentamix. Other companies have also developed mixing machines, such as the hand-held Aquasil Altus from Dentsply/Caulk (see *DIS* 60-13) and the MixStar from Zenith/DMG.

Undoubtedly, manufacturers will continue to improve these materials because they are used so frequently in dentistry. DIS, as always, will continue to keep you informed about new and innovative impression materials as they become available.

(Col Charlton)

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## 64-07 Where Are Compomers Best Indicated for Use?

**Question:** We have a compomer in our clinic but I just don't see where it is indicated for use. Are there special situations where they work better than other kinds of restorative materials?

**Answer:** Before we deal with the clinical indications for compomers, let's review a bit about what these materials are. Basically, compomers (also known as polyacid-modified resin composites) are fluoride-containing resin composites. DIS has evaluated a number of them. The first, Variglass VLC from the Dentsply/Caulk company, was marketed in the early 1990s and was advertised as a light-activated,

multipurpose glass ionomer. Unfortunately, it didn't behave much like a true glass ionomer because it released very little fluoride and didn't set without being exposed to a curing light. If it had been a true glass ionomer or, even for that matter, a combination of resin and glass ionomer (like resin-modified glass ionomers such as Fuji II LC, Vitremer, and Photac-Fil), it would have hardened without light exposure. Despite their limitations, though, compomers have become popular because they handle like resin composites, are generally quite esthetic, and are marketed as having many of the advantages of true glass ionomers, including fluoride release and the ability to chemically bond to tooth structure. Of course, as is true of all dental materials, they have their shortcomings, such as a limited release of fluoride and the inability to be recharged with topically-applied fluoride.

As was mentioned earlier, the compomers remain very popular. The important question (and the one you asked) is: where are these products best indicated for use? Let's try to find a good clinical indication for them based on the types of cases we most commonly treat. The following is a simplification, but it will help us see where compomers may be indicated. Usually, we restore one of the following types of lesions:

- A carious lesion where esthetics is a concern
- A carious lesion where esthetics is not a concern
- A noncarious (e.g., abrasion, erosion, abfraction) lesion where esthetics is a concern
- A noncarious (e.g., abrasion, erosion, abfraction) lesion where esthetics is not a concern

So what types of restorative materials are best suited for these four clinical situations? The following table suggests a specific type of material and gives a rationale for using it in each kind of case.

Type of Lesion	Recommended Restorative	Reason for Choice
Carious; esthetics is a concern	Resin-modified glass ionomer	Provides acceptable esthetics with good fluoride release
Carious; esthetics is not a concern	Glass ionomer	Excellent fluoride release but not very esthetic
Noncarious; esthetics is a concern	Resin composite with current-generation bonding agent	Excellent esthetics with little, if any, fluoride release
Noncarious; esthetics is not a concern	Amalgam	Cost-effective and long-lasting; has no anti-caries effect

While not perfect and somewhat of an oversimplification, this table shows that there really is not a good clinical indication for compomers. Basically, what we see is that there are other materials that are better choices for most situations we encounter. Compomers remain popular, however, and will continue to be for many years. Various commercial brands of restorative glass ionomers, resin-modified glass ionomers, and compomers are given below.

Glass Ionomers	Resin-modified Glass Ionomer	Polyacid-modified Resin Composites (i.e., compomers)
Ketac-Fil (3M ESPE) Fuji II (GC America)	Fuji II LC (GC America) Vitremer (3M ESPE) Photac-Fil Quick (3M ESPE)	Dyract AP (Dentsply/Caulk) Hytac Aplitip (3M ESPE) Compoglass F (Ivoclar Vivadent) elan (SDS/Kerr) F2000 (3M ESPE)

Of course as clinicians we choose the type and brand of restorative material we believe is best suited for each patient. The type of process we just went through, however, can be useful for determining what that material is, especially when faced with a myriad of choices.

(Col Charlton)

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## 64-08 The New Prompt L-Pop

**Question:** I read your review of Prompt L-Pop in DIS 61 and noted its “Marginal” rating. I saw an ad the other day for a new Prompt L-Pop. Is this a new version? If so, how does it differ from the original Prompt L-Pop?

**Answer:** Yes, the all-in-one bonding agent Prompt L-Pop is now available in a reformulated version. The new version is being called Prompt L-Pop 2 by some clinicians although 3M ESPE refers to it simply as Prompt L-Pop. The new version can be identified by the fact that its box bears a round, blue sticker on the front; the original version's box had a red sticker. The new sticker says “For all curing lights-Halogen, Plasma, Laser, LED.”

There are four changes that have been made to the product. First, it has been reformulated with a different photoactivator, camphoroquinone. 3M ESPE claims that this allows the product to be light activated with a variety of curing lights, such as halogen, laser, light-emitting diode, and plasma arc. Second, a subtle yellow tint has been added to the adhesive. This serves two purposes. First, since it is added only to the first blister of the blister pack, it acts as a visual check that the product has been properly activated by thorough mixing. It also makes it easier for clinicians to see where they have applied the product. The third change has been to provide application brushes with a smaller head. Unfortunately, they are only available as a separate order. The final change has been to the product's application technique. The new technique calls for applying the mixed Prompt L-Pop by rubbing it into the tooth surface **with moderate finger pressure** and then lightly drying. It is then **light cured for 10 seconds** prior to placing the restorative resin. Changes to the original technique are listed in bold. No mention was made with the original version of using moderate pressure when applying the product and light curing after application was an optional step. 3M ESPE claims that a separate light curing step makes it easier to place the resin composite or compomer and may improve Prompt L-Pop's performance.

No studies comparing the old and new versions of the product have yet been published, however early testing by an outside organization found no difference in their bond strengths to enamel or dentin. This relatively low bond strength along with the product's very limited clinical uses (for bonding direct, light-cured resin composites and compomers) resulted in the original version being rated “Marginal” by DIS (see *DIS* 61-20).

(Col Charlton)

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## 64-09 How Do I Properly Dispose of the Plastic “Bladders” Found Inside Some Amalgam Capsules?

**Question:** What is the proper method for disposing of the plastic mercury “bladders” that are in some amalgam capsules? Some people in our clinic say that they must be disposed of in the same way as scrap amalgam.

**Answer:** This is a very relevant question due to recent capsule modifications made by the manufacturer of a popular spherical amalgam. Some manufacturers enclose the mercury within the capsules using a

“pillow pack” to prevent premature mixing of the mercury and alloy powder before trituration. The pillow pack is a small, clear, plastic envelope that resembles a bladder. The kinetic energy generated during trituration ruptures the pillow pack and allows the mercury to mix with the alloy powder. The used pillow pack appears as a piece of plastic that usually comes out of the capsule with the mixed amalgam.

As with used amalgam capsules, DIS is not aware of any current directives that require the disposal of any amalgam capsule component as hazardous waste. Remembering the adage of former USAF Dental Corps Commander BGen Gardner, “If you quote me, date me”, DIS is aware of current research involving this environmental issue and new information may be forthcoming. The present recommendation from DIS is that the used plastic pillow pack be put back into the used capsule, the capsule recapped, and then disposed as regular solid waste. Any new information will be made available as DIS becomes aware of it. For further questions, please contact Lt Col Roberts (howard.roberts@ndri.med.nav.mil).

(Lt Col Roberts)

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## 64-10 Pregnancy and Working with Hazardous Chemicals in the Dental Clinic

**Question:** A female dental laboratory technician in our clinic just found out she is pregnant. Can she still work in the laboratory? She’s concerned about working around the chemicals they use there.

**Answer:** First, let me say that this response is addressed to all females who work in the dental clinic, not just dental laboratory technicians, because all workers have the potential to be exposed to hazards. The first step for someone who has just learned she is pregnant is to inform her supervisor. The individual, her supervisor, and the clinic safety representative should then contact their Bioenvironmental Engineering (BEE) unit or the Public Health (PH) section. They, in turn, will review the Material Safety Data Sheets (MSDS) for the chemicals used in her work area to determine if any are considered to be fetal hazards. Chemicals identified as fetal hazards will then serve as a justification for completing Air Force Form 422 (Physical Profile Report). Next, the supervisor should identify the tasks the lab person performs that involve the hazardous chemicals. These tasks should then be avoided during the pregnancy. **It is very important for clinics to have an MSDS for all products used in the facility.** This enables BEE or PH to render a judgment about all the potentially hazardous chemicals. Also, keep in mind that the list of chemicals that are considered to be hazardous to pregnant females may be different from clinic to clinic, because clinics differ in the chemicals that they stock and use. It is a good idea for all workers to review the MSDS of the products used in their workplace so they become familiar with associated hazards. If you are pregnant and uncomfortable with the guidance you have received about working with certain chemicals, consult your physician or health care provider. More information can also be found on the web sites listed below.

NIOSH Pocket Guide  
[www.cdc.gov/niosh/npg/pgdstart.html](http://www.cdc.gov/niosh/npg/pgdstart.html)

"If I'm Pregnant, Can the Chemicals I Work With Harm My Baby?"  
<http://www.dhs.ca.gov/ohb/HESIS/pregfs.htm>

Occupational Safety and Health Administration, Reproductive Hazards  
<http://www.osha-slc.gov/SLTC/reproductivehazards/index.html>

NIOSH/The Effects of Workplace Hazards on Female Reproductive Health  
<http://www.cdc.gov/niosh/99-104.html>

(MSgt Osborn)

# WHAT'S NEW?

"WHAT'S NEW?" features recently-marketed dental equipment and materials. New and innovative products are marketed each month and DIS is unable to evaluate all of them. This section of the newsletter brings these products to your attention. Because DIS has not had the opportunity to evaluate these products, we cannot confirm manufacturers' claims about them. If you would like additional information about the products or are interested in evaluating them, please contact DIS.

The **Cavitron® Select SPS Ultrasonic Scaler** from Dentsply Professional builds upon the Cavitron Select by incorporating five new internal features. The new features include the Sustained Performance System (SPS) technology that lends itself to the name of the new scaler unit. Dentsply claims that the SPS technology prevents the scaler tip from losing power when it comes in contact with tenacious calculus. Also, the unit has a Blue Zone setting that is purported to reduce sensitivity for the extremely sensitive patient. The foot switch on the Select SPS can be depressed during use to briefly increase the unit's power so that hard calculus is more easily removed. The last two features are a Steri-Mate handpiece that can safely be sterilized and a 30-kHz frequency scaler tip that accepts any 30-kHz tip that Dentsply manufactures. The Cavitron® Select SPS is capable of delivering several types of irrigating solutions from its plastic reservoir. The unit is available for \$1831.00 (retail) and \$1190.00 (government) from Dentsply Professional at (800) 989-8826, (717) 767-8500, (717) 767-8250 FAX, or [www.prevent.dentsply.com](http://www.prevent.dentsply.com).

(MSgt Belde)

**Resilience** is a new finishing media that its manufacturer, Garreco, claims can be used for finishing all acrylic-based prostheses. It is reported to be faster and smoother than pumice and promotes easier polishing. Garreco also claims that no change in a technician's usual finishing technique is necessary when using Resilience. Product cost is given in the following table. Resilience can be ordered by contacting Garreco at (800) 334-1443, (501) 362-6261, (501) 362-2264 FAX, or [www.garreco.com](http://www.garreco.com).

Packaging Size	Product Number	Retail Price	Government Price
four 2.5-lb jars	2089002	\$26.00	\$13.00
10-lb carton	2019010	\$20.00	\$9.80
20-lb carton	2019020	\$36.00	\$17.55

(MSgt Osborn)

**QUIKGlaze™**, from All Dental Prodx, is a light-cured varnish for glazing the surface of provisional (temporary) restorations. It can also be used as a bonding agent for repairs and add-ons with provisional materials. QUIKGlaze™ is purported to be a fast, easy method that eliminates polishing, and creates a high gloss on provisionals that is stain and abrasive resistant. The glaze is applied to the surface of the provisional in a thin layer, allowed to seep in for 20 seconds, and then light cured. Hand-held units are said to cure QUIKGlaze™ in 20 to 40 seconds, while light ovens cure it in 90 to 180 seconds. The product comes in a 5-mL bottle/box (item number 200130) for \$54.95 (retail) and \$46.75 (government). For ordering

information, call All Dental Prodx at (877) 64-PRODX, (253) 265-8624, or [www.alldentalprodx.com](http://www.alldentalprodx.com).

(MSgt Osborn)

The **Disclose Dry Handle Swabs** from Beutlich Pharmaceuticals are an alternative to using tablets or liquid for disclosing intraoral plaque. The disclosing swabs are individually packaged and intended for single use. The swabs' cotton-tipped end is saturated with 0.25 mL of disclosing solution. To use the a swap, the provider squeezes it to saturates the swap with disclosing solution. The swab is then removed and applied to the teeth. The product is purported to be neater and easier to use than standard disclosing solutions or tablets. Disclose Dry Handle Swabs are available in two packaging forms: a box of 100 for \$65.99 (retail) and \$29.70 (government) and a peel pack of 6 for \$7.65 (retail) and \$3.45 (government). Please note that minimum order amounts exist. The swabs can be ordered from Beutlich Pharmaceuticals at (800) 238-8542, (847) 473-1100, (847) 473-1122 FAX, or [www.beutlich.com](http://www.beutlich.com).

(MSgt Belde)

The **Twist2it Disposable Prophy Angle** marketed by Twist2it, Inc. is a disposable prophy angle with an innovative feature not found in other disposable prophy angles (DPAs). DPAs operate by continuous 360-degree rotating motion of a polishing. In contrast, the Twist2it operates with a reciprocating (back and forth) 90-degree motion. The reciprocating motion is purported to provide several advantages compared to that of a standard DPA: (1) a reduction in heat and splatter which permits it to be used to apply acid etchant, fluoride, and other medicaments, and (3) the ability to use it to clean around orthodontic appliances without the cup getting caught in the appliances. The manufacturer claims that using the Twist2it is different from using typical disposable prophy angles. With a standard DPA, the cup is constantly being lifted from the tooth surface to reduce heat, but the TDPA can be left directly on the tooth because it produces less heat. This also makes it possible to more easily remove tenacious stain because the cup can be applied with more pressure. The Twist2it is available in four models: a soft cup (item number TWSC001), a hard cup (item number TWHC002), a flat brush (item number TWFB003), and a tapered brush (item number TWTB004). The cups retail for \$59.95 per package of 100, and the brushes retail for \$79.95 per package of 100. For additional information and government prices, contact Twist2it, Inc. at (877) 776-7497, (718) 672-4324, (718) 396-4500 FAX, or [www.twist2it.com](http://www.twist2it.com).

(MSgt Belde)

**Quell** is a new dentin desensitizer marketed by Jeneric/Pentron. The product consists of two separate bottles: the first contains an aqueous solution of calcium chloride and the second is an aqueous solution of potassium phosphate. The product purportedly works by laying down a layer of amorphous calcium phosphate gel that plugs the dentin tubules orifices. Because it contains no HEMA (hydroxyethyl methacrylate) or glutaraldehyde, Jeneric/Pentron claims it is kind to soft tissues, so it is ideal for treating lesions in close proximity to soft tissues. Also reported as advantages of Quell are that it results in immediate relief from sensitivity, does not require an additional light-curing step, and can be applied in under 2 minutes. Since it has a listed film thickness of only 3 microns, Jeneric/Pentron notes it can be used to desensitize prepared teeth prior to temporization or crown cementation. A Quell Kit (item number N46) contains a 4-mL bottle of Part A, a 4-mL bottle of Part B, and applicators. It is available for \$79.95 (retail) and \$71.96 (government) from Jeneric/Pentron at (800) 551-0283, (203) 265-7397, (877) 677-8844 FAX, or [www.jeneric.com](http://www.jeneric.com).

(Col Charlton)

The **McBinn Sharpening Stone** is a sharpening stone composed of compressed ceramic material with two sides: course and fine. The course side is used for gross removal and instrument shaping, while the fine side is recommended for chairside sharpening. The manufacturer, American Eagle Instrument, Inc., claims that the 3½ -inch-long stone is quiet during use which makes it patient friendly. It is also said to be completely sterilizable, require no lubricant, and comes in two widths: 7/8 inch ("wide") and ½ inch ("narrow"). The wide stone (item no. AE-FAMWS2) is available for \$41.00 (retail) and \$26.72 (government). The narrow stone (item no. AE-FAMWS2N) is available for \$30.90 (retail) and \$18.54 (government) from American Eagle at (800) 551-5172, (406) 542-8541, (406) 549-7452 FAX, or [www.am-eagle.com](http://www.am-eagle.com).

(MSgt Belde)

The **White Shield Safety Saliva Ejector** is a dental suction device that is purported to eliminate the possibility of reverse flow (i.e., backflow) from the low-volume suction line into the patient's mouth. This saliva ejector features patented venting channels along the length of the tip that allow air into the oral cavity and prevent the patient from forming a complete seal around the ejector when he/she closes their lips around it. The manufacturer also claims that the venting channels aid in reducing hematoma formation or tissue damage that can occur when soft tissue is pulled up into the saliva ejector. At its mouthpiece, the product is 1.5 mm larger in diameter than a standard saliva ejector tip, but it attaches to the same standard diameter tubing. It is, therefore, compatible with standard dental industry equipment. The White Shield Safety Saliva Ejectors are available for \$50.00 (retail/government) for 1,000 ejectors from White Shield, Inc. at (780) 448-1246 or (780) 448-1433 FAX.

(Col Bartoloni)

The **STEAMPlus™ Steam Sterilization Integrator** is a device that provides a simple, accurate method of assuring that proper conditions for sterilization have been met during a sterilizer cycle. It is certified for use with all steam sterilization processes (i.e., gravity, vacuum, flash). The manufacturer purports that the STEAMPlus™ has documented performance equal to that of a biological indicator *plus* an added safety margin. The device is engineered to specifically integrate the three critical variables of sterilization: time, temperature, and steam. The manufacturer claims that this information is displayed in a precise, easy-to-read format. Use of one integrator is recommended for each load processed. STEAMPlus™ Steam Sterilization Integrators (cat. no. SSI-100) are available in a package of 100 for \$50.00 (retail/government) from SPS Medical at (800) 722-1529, (716) 359-0130, (716) 359-0167 FAX, or [www.spsmedical.com](http://www.spsmedical.com).

(Col Bartoloni)

**Tetric Ceram HB** is a high-viscosity, fluoride-containing, visible-light-cured microhybrid resin composite marketed by Ivoclar Vivadent. Compositionally, it is similar to Tetric Ceram but has a thicker consistency that the manufacturer claims makes it easier to pack into posterior preparations and produce acceptable proximal contacts. The "HB" in its name, in fact, stands for "heavy body." Its heavier consistency, at least in part, is due to the fact that it contains a greater amount of highly dispersed silica filler particles. Its 80.4% filler content (by weight) is slightly higher than that of Tetric Ceram (78.6%). Tetric Ceram HB is specifically recommended for the direct restoration of Class I and Class II preparations. Ivoclar Vivadent claims that the product is highly radiopaque and can be cured in increments up to 2.5-mm thick in only 20 seconds. Tetric Ceram HB is available in six shades and is packaged in syringes or unit-dose capsules (Cavifils). The Cavifil Intro Kit is available for \$130.00 (retail) and \$55.55 (government) from Ivoclar Vivadent at (800) 533-6825, (716) 691-0010, (716) 691-2285, or [www.ivoclarvivadent.us.com](http://www.ivoclarvivadent.us.com).

(Col Charlton)

**StatStone** from Heraeus Kulzer, Inc. is a fast-setting stone with the purported strength, durability, and accuracy of traditional type III stones. It is best used for casts when making custom trays, mouthguards, vacuum-formed stents, and denture repairs where the stone's strength and speed of setting are important. StatStone is said to have a working time of 1 minute, and the impression can be removed from the cast after 5 minutes of setting time. Its reported compression strength is 3,800 psi at 15 minutes and 11,000 psi at 24 hours, along with an expansion of 0.07% at 15 minutes, and 0.11% at 1 hour. StatStone is available in two packaging sizes: 24 120-g packages for \$18.60 (retail) and \$11.90 (government); and 25-lb cartons for \$42.65 (retail) and \$27.46 (government). For additional ordering information, contact Heraeus Kulzer at (800) 343-5336, (219) 291-0661, (219) 291-7248 FAX, or [www.kulzer.com](http://www.kulzer.com)

(Msgt Osborn)

**Helioseal Clear Chroma** is described by its manufacturer (Ivoclar Vivadent) as a "transparent fissure sealant with reversible color change." It uses a photochromic dye that produces a reversible color change

to enhance visualization during recall appointments. After being placed and light cured for 20 seconds, the sealant is purported to be colorless and transparent. This is said to produce an esthetic, "invisible" result for maximum esthetics. When exposed for a few seconds to a curing light at recall appointments, the sealant temporarily turns dark green to facilitate visual and tactile examination assessing retention. After a few minutes, it once again becomes colorless and transparent. Helioseal Clear Chroma is packaged in a small paper box that contains 5 syringes of the sealant, one bottle of 37% phosphoric acid etchant, disposable syringe tips, and disposable cannulas for the acid etchant. Written instructions are included as well as a summary instruction card and a material safety data sheet. The product is available for \$83.72 (retail) and \$46.46 (government) from Ivoclar Vivadent at (800) 533-6825, (716) 691-0010, (716) 691-2285, or [www.ivoclarvivadent.us.com](http://www.ivoclarvivadent.us.com).

(Col Charlton)

The **Open Wide Disposable Mouth Prop** is a new latex-free mouth prop from the Specialized Care Company that is advertised as a sturdy mouth prop for use during prophylaxis procedures. It purportedly is comfortable in the mouth, effective at keeping the teeth from occluding, and allows for greater visibility and control during cleanings. It is made of high-density foam and has a wedge-shaped end that is said to accommodate various mouth sizes. The Open Wide Disposable Mouth Prop has a rigid wooden core within the handle that adds strength and stability. The product is available in various quantities. A container of 50 (code OWD-50) is available for \$43.00 (retail and government) from the Specialized Care Company at (800) 722-7375, (603) 926-0071, (603) 926-5905 FAX, or [www.specializedcare.com](http://www.specializedcare.com).

(TSgt Sutter)

Clinicians are often tasked with brushing the teeth of an individual with physical or mental limitations. When doing so, it can be difficult to position the brush properly at the gingival margin and to gain access to the lingual surfaces of the teeth. The **TwinBrush** is a toothbrush from Specialized Care Company designed to address these difficulties. It has two brush heads purportedly positioned at the proper angle to clean both the gingival tissues and the teeth, and to clean both the buccal and lingual surfaces of the teeth simultaneously. The handle is curved to permit an controlled grip and there are two rows of short overlapping bristles designed to clean the occlusal surfaces. The manufacturer claims the brush has a compact head and its soft, end-rounded bristles enhance patient comfort and safety. A single TwinBrush (code TB-R1) is available for \$3.95 (retail and government) and 12 (code TB-R12) cost \$43.00 (retail and government). It is available from the Specialized Care Company at (800) 722-7375, (603) 926-0071, (603) 926-5905 FAX, or [www.specializedcare.com](http://www.specializedcare.com)

(TSgt Sutter)

Two new items from Specialized Care Company are the **Open Wide Wraparound Mouth Prop** and the **Open Wide Tab Mouth Prop**. Both are designed to facilitate easy access to the oral cavity and have a rigid core over-molded with a soft material for patient comfort. The Open Wide Wraparound Mouth Prop has a curved handle that is designed to allow the clinician to control the placement of the prop without blocking intraoral access. The manufacturer claims that it provides greater stability than a mouth prop without a handle. It is also said to be more patient friendly than a ratchet-style mouth prop. The Open Wide Tab Mouth Prop is a modified version of the previous product in which a small extension tab takes the place of the handle. Designed for longer procedures such as sealant placement, it has a hole in the plastic tab to accommodate floss and can be used with a rubber dam. Both items are autoclavable and latex free. The Open Wide Wraparound Mouth Prop comes in small and medium sizes. A set of two is available for \$45.00 (retail and government), while two of the Open Wide Tab Mouth Props (code OWT-2S) cost \$37.00 (retail and government). The products are available from the Specialized Care Company at (800) 722-7375, (603) 926-0071, (603) 926-5905 FAX, or [www.specializedcare.com](http://www.specializedcare.com).

(TSgt Sutter)

Ivoclar Vivadent recently introduced the **Astralis® 7** curing light. It is a corded visible-light-curing unit equipped with a 75-watt quartz-halogen bulb and features three different power programs. The Low Power

program maintains the light intensity at a constant 400 mW/cm<sup>2</sup> and is used for curing materials near the dental pulp or in cervical areas. The High Power program provides a continuous 750 mW/cm<sup>2</sup> for polymerizing through tooth structure, indirect restorations, and translucent materials. The Pulse program is used for curing direct resin restoratives to minimize the development of polymerization stresses. This program increases the light intensity in the first 15 seconds from 150 to 400 mW/cm<sup>2</sup>, then during the next 25 seconds, pulses between 400 and 750 mW/cm<sup>2</sup> every two seconds. All program selections and light activation controls are contained on the gun-shaped handpiece. The light unit comes with a 10-mm-diameter light guide, six-foot connection cable, handpiece holder, and 3 anti-glare cones that fit over the light guide. Additional light guides that are available include 8- and 13-mm-diameter guides, a 2-mm-diameter "Pin-Point" guide, and an 8-mm-diameter "Power Booster" guide. The Astralis® 7 with the "Classic White" finish can be purchased for \$724.50 (retail) and \$415.00 (government). Two other finishes, "Carbon" and "Elegance", are available at a slightly higher price. Further information is available from Ivoclar Vivadent at (800) 533-6825, (716) 691-0010, (716) 691-2285, or [www.ivoclarvivadent.us.com](http://www.ivoclarvivadent.us.com).

(Col Leonard)

The **Astralis® 10** is the latest, most powerful curing light marketed by Ivoclar Vivadent, Inc. A corded unit, it is equipped with a 100-watt quartz-halogen bulb and features four different power programs. The Adhesive program maintains the light intensity at a constant 650 mW/cm<sup>2</sup> for 20 seconds and if used for curing materials near the dental pulp or in cervical areas. The High Power program provides a minimum of 1200 mW/cm<sup>2</sup> for 10 seconds which, Ivoclar Vivadent claims, is able to cure resin composites with shade A3.5 or lighter in only 10 seconds. The Pulse program is used for curing direct resin restoratives to minimize the development of polymerization stresses. This program increases the light intensity in the first 10 seconds from 150 to 650 mW/cm<sup>2</sup>, then during the next 10 seconds, pulses between 650 and 1200 mW/cm<sup>2</sup> every two seconds. Finally, the Esthetic Cementation System program is for polymerizing through tooth structure or translucent materials when cementing indirect esthetic restorations. All program selections and light activation controls are contained on the gun-shaped handpiece. Included with the unit is an 8-mm-diameter "Power Booster" light guide, six-foot connection cable, handpiece holder, and 3 anti-glare cones that fit over the light guide. Additional light guides available include 8-, 10- and 13-mm-diameter guides and a 2-mm-diameter "Pin-Point" guide. The Astralis® 10 with the "Classic White" finish costs \$1200.00 (retail) and \$625.00 (government). A "Carbon" finish is available at a slightly higher price. Further information is available from Ivoclar Vivadent at (800) 533-6825, (716) 691-0010, (716) 691-2285, or [www.ivoclarvivadent.us.com](http://www.ivoclarvivadent.us.com).

(Col Leonard)

**Coltosol** is a new temporary restorative material that is said to be simple to dispense, quick to place, and easy to remove. The non eugenol-containing material, from Coltene/Whaledent, comes as a paste that is dispensed from a tube. Coltene claims that this saves time compared to powder/liquid temporary products that must be mixed prior to placement. It is purported to seal margins well because it expands when it hardens. It is auto-setting and is said to be radiopaque and removable in large pieces. A single 8-g syringe of Coltosol (item number C5935) is available for \$5.93 (retail) and \$3.08 (government) from Coltene Whaledent at (800) 225-9382, (201) 512-8000, (201) 529-2103 FAX, or [www.coltenewhaledent.com](http://www.coltenewhaledent.com)

(Col Charlton)

**Revotek LC** is a product from GC America for making provisional (i.e., temporary) restorations. The single-component, visible-light-cured resin is recommended by the manufacturer for making crowns, bridges, inlays, onlays, and veneers. Because it is free of methyl methacrylate, GC claims that the material does not irritate the soft tissues, give off heat during setting, or have an offensive odor. Revotek LC differs from standard provisional materials in that it is used with a freehand technique intraorally to make provisionals. The material is supplied as a 4½-inch-long roll of resin in a sealed foil pouch. After cutting off the amount required for the provisional restoration, the roll of Revotek LC is stored in a lightproof plastic tray with a sliding cover. The resin comes in one universal shade (B2) and is used by adapting a selected amount onto the prepared tooth/teeth. After adapting, sculpting, and having the patient occlude into the resin to establish a functionally-generated occlusion, a standard light curing unit is used for 10 seconds to

secure the provisional's shape. The provisional is then removed from the mouth and given a final 20-second light exposure. Following light curing, it can be finished and polished. In addition to using Revotek LC for making provisionals, GC suggests that it can be used to reline existing provisionals. A single roll of Revotek LC is purported to be enough for 30 average-size crowns. A Revotek Introductory Set contains a single 4-inch-long roll of the material, a lightproof storage case, and a plastic placement/contouring instrument. It is available for \$39.95 (retail) and \$26.00 (government) from GC America at (800) 323-7063, (708) 597-0900, (708) 371-5103 FAX, or [www.gcamerica.com](http://www.gcamerica.com).

(Col Charlton)

**Systemp.desensitizer** is a product marketed by Ivoclar Vivadent for preventing/reducing dentinal hypersensitivity. The company claims it can be used under most direct restorations as well as before cementing temporary or permanent restorations. It is said to have no effect on the bond strength of adhesives, cements, or direct restorative materials. Systemp.desensitizer is an aqueous solution of two active ingredients, polyethyleneglycol dimethacrylate and glutaraldehyde, which are purported to reduce sensitivity by sealing dentin tubules. The product is applied by brushing it onto the tooth structure for 10 seconds. Excess liquid is then gently dispersed into a thin layer using compressed air. Systemp.desensitizer can be applied before or after acid etching. It is available in bottle form or in unit-dose capsules that have an attached disposable applicator. The unit-dose packaging version (50 capsules) is available for \$85.00 (retail) and \$28.40 (government) from Ivoclar Vivadent at (800) 533-6825, (716) 691-0010, (716) 691-2285, or [www.ivoclarvivadent.us.com](http://www.ivoclarvivadent.us.com).

(Col Charlton)

The **Pro Blend Mixer** is the next generation of vacuum mixer from the Whip Mix Corporation. It features a dual-motor construction (one motor for producing vacuum and one motor for mixing) and a self-contained, oil-less vacuum pump. The Pro Blend provides hands-free mixing. The mixing cycle automatically starts when vacuum is reached and stops mixing when the programmed time has been completed. A built-in electronic timer can be adjusted in increments of five seconds and defaults to the previous settings each time the unit is used. The unit also has a vacuum-release switch and a vacuum gauge that displays from 0 to 30 inches of Hg. The Pro Blend Mixer comes with a bracket for wall mounting and a 500-mL-capacity Vac-U-Mixer. The unit is 15" W x 9¾" H x 10¼" D and weighs 27 pounds. It is available for \$1690.00 (retail) and \$1267.00 (government). Accessories that are sold separately include the Pro Blend Stand (as shown in the figure), Pro Vac-U-Mixer (300 mL, 500 mL, and 875 mL), and replacement bowls. For more information, contact Whip Mix at (800) 626-5651, (502) 637-1451, or [www.whipmix.com](http://www.whipmix.com).

**Bistite II DC** is a newly formulated dual-cure resin cement from the Tokuyama Company (distributed by J. Morita USA). It comes with a self-etching primer and is available in three shades (Clear, Ivory, and Dentin), all available separately. Indications include the cementation of:

- Metal crowns, inlays, onlays, and adhesive bridges
- Porcelain-fused-to-metal crowns
- Cast post and cores as well as prefabricated posts
- Ceramic and porcelain crowns, inlays, onlays, bridges, and veneers
- Cured composite crowns, inlays, and onlays

In addition to cementation, the product can be used to repair fractured porcelain-fused-to-metal restorations. Bistite II DC comes with a free bonus pack of Ceramic Primer and Metallite. According to the manufacturer, the two-bottle Ceramic Primer eliminates the need for hydrofluoric acid, and Metallite eliminates the need for tin plating noble metal restorations prior to luting. The cement is packaged in a cartridge and is dispensed using a syringe-style dispenser that expresses equal amounts of the base and catalyst pastes. Tokuyama claims that the product has a low film thickness (8 microns) and an effective shelf life of three years. Physical property data for the product provided by the manufacturer are similar to that of Bistite II SC, the self-cure version of the cement currently being evaluated by DIS. A box of Bistite II DC is available for \$170.00 (retail) and \$119.00 (government) from J. Morita USA at (888) 566-7482, (949) 581-9600, (949) 465-1095 FAX, or [www.jmoritausa.com](http://www.jmoritausa.com).

(Col Charlton)

# FROM THE LITERATURE

Periodically, articles appear in the literature that present clinically useful information or evaluate the performance of a material or piece of equipment. Because DIS believes that this type of research is of value to clinicians, we present a brief description of these articles to make you aware of them. The complete citation is provided so you can obtain the article if you are interested in reading it in its entirety.

## *PERCUTANEOUS INJURIES IN DENTISTRY*

Management of needlestick injuries in general dental practice. Smith AJ, Cameron SO, Bagg J, Kennedy D. Br Dent J 2001;190:645-650.

While treating patients, dental healthcare workers may be exposed to bloodborne pathogens including hepatitis B virus, hepatitis C virus, and human immunodeficiency virus. The risk of transmission is based on the type of exposure (e.g., percutaneous, mucous membrane, non-intact skin) and the serologic status of the source patient. Needlestick injuries represent the greatest risk of transmission and are of growing concern to all healthcare workers. The objective of this article was to highlight the management of needlestick injuries in general dentistry including first aid measures, risk assessment, and chemoprophylaxis. **Studies have indicated that the risk of bloodborne pathogen transmission in dentistry is low. However, it is essential that all dental clinics have a written protocol for the management of sharps injuries that is accessible to all staff members. All members of the dental team should receive training stressing prevention.**

*DIS Comment: This article was written and published in the United Kingdom and contains minor modifications of recommendations published in the United States, but it is an excellent review of the proper management of sharps injuries in dentistry.*

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## *IS DIGITAL RADIOGRAPHY BETTER THAN USING CONVENTIONAL FILM?*

A comparative evaluation of the diagnostic efficacy of film and digital sensors for detection of simulated periapical lesions. Wallace JA, Nair MK, Colaco MF, Kapa SF. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2001;92:93-97.

Diagnosis of periapical pathology through the use of radiographs is essential for treatment planning in endodontics. Digital radiography is an emerging technology that has many purported benefits in dentistry. Digital imaging systems include charge-coupled devices (CCD), complementary metal-oxide semiconductors (CMOS), and photostimulable phosphors (PSP). The purpose of this study was to compare the diagnostic efficacy of standard Ektaspeed Plus Film (EPF), a CCD, and a PSP device for the detection of simulated periapical lesions. **Results showed that EPF displayed the highest sensitivity and specificity, followed by PSP and CCD images.** Differences noted on the basis of the size of the induced lesion indicate that larger lesions were easier to detect than smaller ones.

*DIS Comments: Many studies have been published with conflicting opinions regarding whether film-based or digital radiography is more diagnostic for detecting caries, periodontal bone loss, and periapical lesions. Extrapolation of the results of this study to the clinical setting should be made with caution.*

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## *DO CONTINUOUS-TREATMENT BIOCIDES AFFECT ENAMEL BOND STRENGTHS?*

Effect of dental unit waterline biocides on enamel bond strengths. Taylor-Hardy TL, Leonard RH, Mauriello SM, Swift EJ. Gen Dent 2001;49:421-425.

The dental literature contains many studies discussing bacterial contamination and biofilm formation in dental unit waterlines. Since these reports, many products and protocols have been recommended to treat waterlines in an attempt to improve the quality of the water they carry. One recommended method is the use of an independent water reservoir and the continuous use of an antimicrobial agent in the treatment water. However, there are few reports on how the use of a continuous-treatment solution affects adhesion of restorative materials to tooth structure. The purpose of this study was to determine if various biocide solutions affect enamel-resin shear bond strengths. Sixty bovine incisor teeth were treated with six different treatment regimens using five biocides. Following treatment, cylinders of Z100 resin composite were bonded to the enamel surfaces using Single Bond bonding agent. Shear bond strengths were measured 24 hours after bonding. **The results indicated that some chemical biocides can affect enamel-resin bond strength.** The exact reasons for this reduced bond strength are unknown, but the authors theorize that it may be due to a change in the enamel's surface chemistry and/or structure that occurs when it is exposed to certain contaminants.

*DIS Comment: To date, the dental literature contains very few studies addressing the effects of continuous-use dental waterline disinfectants on adhesive dentistry. The results of this study indicate that dentists should use caution when using biocides continuously in an independent water system. Further research is needed to understand the impact of continuous-use biocides and adhesive restorative materials.*

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### **DOES A “SHOCK-ABSORBING” ADHESIVE REALLY PERFORM BETTER?**

Clinical evaluation of two one-bottle dentin adhesives at three years. Swift EJ, Perdigão J, Wilder AD, Heymann H, Sturdevant JR, Bayne SC. J Am Dent Assoc 2001;132:1117-1123.

Fifth-generation bonding agents were introduced to the market in the early 1990s. They represented a step forward in simplicity of application because they consist of two components: a standard acid etchant and a combined primer/adhesive. Although they have generally performed well in the laboratory, the ultimate test of any dental material is its clinical performance. This study is a clinical evaluation of the performance of two fifth-generation bonding products over three years. A total of 101 noncarious cervical lesions were restored using either the filled, ethanol-based OptiBond Solo (SDS/Kerr) or the unfilled, acetone-based Prime & Bond 2.1 (Dentsply/Caulk) and their respective manufacturers' hybrid resin composite. No mechanical retention was placed and the enamel margins were not beveled. The restorations were clinically evaluated at baseline, 6 months, 18 months, and 36 months using modified Cvar/Ryge criteria. Results indicated that at 36 months, the retention rate for OptiBond Solo was 93.3 percent and 89.4 percent for Prime & Bond 2.1. No significant difference was found between these rates. For both products, 12 percent of the restorations exhibited marginal staining, but none had recurrent caries. The remaining evaluation criteria were rated as excellent. **The authors concluded that both fifth-generation bonding products performed extremely well over the three-year period.**

*DIS Comment: This article was designed to evaluate the performance of two compositionally-different fifth-generation products. OptiBond Solo is filled and uses an ethanol solvent, while Prime & Bond 2.1 is unfilled and contains acetone. The study was designed to determine if a filled or an unfilled adhesive performed better in the mouth. Some researchers believe that a filled adhesive serves as a “shock absorber” to relieve stresses that occur between the tooth and resin composite as the resin shrinks during polymerization. They believe that this may enhance the retention of these types of bonded restorations. If differences between OptiBond Solo and Prime & Bond 2.1 had been found in the current study, however, it would have been hard to ascribe them solely to the fact that OptiBond Solo is filled because other variables were present. The authors were aware of this and identified two of the variables as the bonding agents' different types of solvents and the two different resin composites used to restore the teeth. Regardless, this is a valuable study because it reports clinical results, and it is encouraging to see that both products performed well.*

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## **PANORAMIC RADIOGRAPHS CAN FACILITATE SCREENING FOR STROKE**

Carotid artery atheromas in post-menopausal women: their prevalence on panoramic radiographs and their relationship to atherogenic risk factors. Friedlander AH, Altman L. J Am Dent Assoc 2001;132:1130-1136.

Stroke is the third leading cause of death in post-menopausal women due to physiological changes and other aging processes. The majority of strokes in this group are the result of ischemic cerebral injury caused by atherosclerotic disease (i.e., thrombus and embolus formation). Published data indicate that the most likely cause is high-grade stenotic lesions at the carotid bifurcation. Many times, the atherosclerotic lesions are calcified and can be detected on dental panoramic radiographs. The purpose of this study was to determine the prevalence of atheromas on panoramic radiographs of post-menopausal, neurologically asymptomatic women aged 55 years and older, and to identify atherogenic risk factors from the medical histories. Results showed that for 5 of the 16 subjects (31%), the radiographs exhibited atheromas in the neck located about 2 centimeters inferior and posterior to the mandibular angle. These findings were confirmed by the presence of atheromas on anteroposterior cervical spine radiographs. The subjects had the following atherogenic risk factors: hypertension, smoking, hyperlipidemia, type 2 diabetes mellitus, and elevated body mass index. **The results of this study show that some older women with calcified carotid artery atheromas can be identified using panoramic radiographs.**

*DIS COMMENT: This is one of several recent studies that have found that calcified carotid artery atheromas can be detected on dental panoramic radiographs. Identifying calcifications has major clinical significance due to the relationship between the presence of these calcifications and the increased risk for stroke. If they are noted on a panoramic film, dental providers should refer these patients to an appropriate physician for further evaluation and treatment.*

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## **SELF-CURED COMPOSITES BONDED WITH LIGHT-CURED ADHESIVES: BE CAREFUL!**

Effects of restorative and adhesive curing methods on dentin bond strengths. Swift EJ, Perdigão J, Combe EC, Simpson CH, Nunes MF. Am J Dent 2001;14:137-140.

Light-cured bonding agents are most commonly used to bond light-cured resin composites to tooth structure. There are certainly situations, however, where these adhesives are used to bond self-cured composites to teeth. One good example is during the placement of a resin core buildup prior to prosthodontic treatment. Anecdotal reports indicate that some self-cured composites bond poorly when bonded with light-cured adhesives. This study was done to evaluate under controlled conditions, whether or not these anecdotal observations are accurate. The researchers used Scotchbond MPA (in its light-cured and self-cured versions), One-Step (light-cured), OptiBond Solo Plus (light-cured), Prime & Bond NT (light-cured), and Prime & Bond NT (dual-cured) to bond a self-cured (Bisfil 2B) and a light-cured (Z100) composite to bovine dentin. Shear bond strengths were measured after 24 hours. Results showed that when using the light-cured composite, bond strengths ranged from 11.0 MPa for light-cured Prime & Bond NT to 26.3 MPa for OptiBond Solo Plus. Using the self-cured composite resulted in bond strengths that ranged from 0 MPa for light-cured Prime & Bond NT to 21.4 MPa for One-Step. Two of the adhesives, light-cured Prime & Bond NT and OptiBond Solo Plus had significantly lower bond strengths when used with the self-cured composite. **The authors concluded that some light-cured single-bottle (i.e., fifth-generation) bonding agents may not provide acceptable bonding to tooth structure when used with self-cured resin composites.**

*DIS Comment: This study helps to confirm what have previously only been anecdotal reports of problems in bonding self-cured composites to teeth using light-cured adhesives. The clinical implications of this study are obvious: clinicians should be cautious when using light-cured adhesives with self-cured composites. Most often this will be encountered when bonding a self-cured resin composite core material to tooth structure, however other clinical situations call for the use of this combination of materials. More recent research has implicated low pH of the bonding agent as the culprit in causing the weak bond to self-cured composite. The best advice for clinicians is to use only those products together that have been*

shown by research to perform properly. This article does a great service in providing that information; future research most assuredly will evaluate combinations of other brands of bonding agents and composites.

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### **10-YEAR CLINICAL PERFORMANCE OF A HYBRID RESIN COMPOSITE**

Clinical evaluation of posterior composite restorations: the 10-year report. Gaengler P, Hoyer I, Montag R. J Adhesive Dent 2001;3:185-194.

This study reported on the 10-year clinical performance of a hybrid resin composite, Visio-Molar radiopaque from ESPE. A total of 115 Class I and 79 Class II restorations were placed in premolars and molars in 73 adult patients. The preparations were minimally invasion and were performed under rubber dam. Following preparation, the dentin was covered with Ketac-Bond (ESPE), a chemically-set glass-ionomer cement, and the enamel was etched and an enamel bonding agent (Universalbond, ESPE) was applied. The restorative resin was then incrementally placed and light activated. The restorations were evaluated at baseline, 6 months, 1 year and then annually by two evaluators. Evaluations were made of seven clinical performance characteristics using the USPHS criteria. Of the 46 restorations that were longitudinally controlled over the entire period, 44 showed correct anatomic form. All, however, exhibited a rough surface and wear. A majority were free of marginal discoloration, and only 3 showed a significant discoloration. Marginal integrity was optimal at baseline and by two years, a continuing degradation started that lasted throughout the study. **The authors found that the overall 10-year failure rate was 25.8%, and they concluded that the restorations provided good clinical service for from 6 to 10 years. Early failure was due to bulk fracture and loss of material, while the late risk of failure was due to secondary caries.**

*DIS Comment: This study was designed to evaluate how well a hybrid resin composite performed when it was placed over a glass-ionomer used as a liner/base. As one of few true prospective long-term studies, the results are important. One of the many realities in doing long-term studies is that frequently the studied material is no longer commercially available when the study is finished. Also, procedures may now be different for placement of the material. Despite this, the results can be used as an indication of performance of at least that specific material (if not a class of materials) that was commonly used at the time. It can also be used to compare currently available materials to see if new formulations have resulted in better clinical performance.*

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### **DENTAL UNIT WATERLINE STUDY**

Evaluation of a hydrogen peroxide disinfectant for dental unit waterlines. Linger JB, Molinari JA, Forbes WC, Farthing CF, Winget WJ. J Am Dent Assoc 2001;132:1287-1291.

Potentially pathogenic microorganisms have been identified in water samples from dental unit waterlines (DUWLs). Both patients and dental personnel may be at risk from exposure to water spray and aerosols during dental treatment. To date, however, there have been no reported disease outbreaks from DUWL contamination that suggest a quantifiable epidemiologic risk. Several strategies exist to control bacterial colonization and growth including waterline flushing, use of independent water reservoir systems with periodic and/or continuous chemical disinfection, and filtration. In this study, the authors investigated the use of a hydrogen peroxide-based disinfectant and suggested a protocol to evaluate reduction of colonization and growth of heterotrophic bacteria in previously untreated DUWLs. Twenty-three dental units installed with self-contained water systems were selected, of which three were designated as controls (untreated). Tap water was used as the source water throughout the evaluation. The treated units were cleaned with the hydrogen peroxide-based disinfectant (Sterilex Ultra, Sterilex Corporation) following the manufacturer's instructions. Water samples were taken at baseline and once per week for five weeks at a worst-case point immediately before chemical treatment. At the conclusion of the study, ten units were randomly selected for scanning electron microscopy to evaluate biofilm removal. **Results showed that by week 4, all treated dental units had microbial counts below the American Dental Association's recommended goal of 200 colony-forming units per milliliter (CFUs/mL). All control units had significant contamination. Tubing samples from untreated control units exhibited a variety of**

**biofilm formation, while the treated units showed minimal presence of residual matrix.** Clinicians need to consider many factors when selecting a DUWL agent including its efficacy in reducing CFU counts, potential for dental unit corrosion, and byproduct formation. Users should also be aware that disinfectants may affect the bond strengths of restorative systems. Successful treatment of DUWLs depends on the degree of compliance achieved with the manufacturer suggested protocol. Protocols that are easy-to-use require minimal time to implement and are cost effective will most likely increase compliance.

*DIS Comment: There are currently many products available for treating dental unit waterlines, including ones containing chlorine dioxide, sodium hypochlorite, iodine, chlorhexidine gluconate, and hydrogen peroxide. All have been found to be efficacious if their manufacturers' instructions are carefully followed. Sterilex Ultra (previously called UltraKleen) has been evaluated by DIS (see DIS 60-20), and was rated "Acceptable." It is used for three consecutive overnight treatments, followed by one overnight treatment each week. Sterilex Ultra has also been authorized by the A-dec Corporation for treating its dental units.*

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### ***THE OLD QUESTION: HOW MOIST SHOULD DENTIN BE FOR BONDING?***

How wet should dentin be? Comparisons of methods to remove excess water during moist bonding. De Silveira Pereira GD, Paulillo LA, De Goes MF, Dias CT. J Adhesive Dent 2001;3:257-264.

Many currently available dentin bonding agents have been shown to bond more strongly to moist than to dry dentin. Many ways of providing a moist dentin surface have been suggested. The purpose of this study was to evaluate the bond strength of two dentin bonding agents to dentin that had been dried in a number of different ways. Two hundred ten teeth were prepared to provide flat dentin surfaces. After the dentin was acid etched with 35% phosphoric acid and rinsed, seven methods of drying the dentin were used: a 30-second air spray, a 5-second air spray, dry cotton pellets, wet cotton pellets, a microbrush, and absorbent paper. The final group was left wet. Prime & Bond 2.1 (Dentsply/Caulk) or Scotchbond Multi-Purpose Adhesive (3M ESPE) was then used to bond Z100 (3M ESPE) to the dentin. At 7 days, shear bond strength was measured. Analysis showed that the two bonding agents behaved differently in the presence or absence of dentin moisture. Prime & Bond 2.1 produced significantly stronger bonds to moist dentin than to dry. It exhibited its strongest bond when the dentin was dried with either a moist cotton pellet or with a 5-second air blast. With Scotchbond MPA, however, strong bonds were produced to both moist and dry dentin. Both bonding products performed poorly when applied to overwet dentin. **The authors concluded that shear bond strengths are affected by both degree of dentin moisture and dentin bonding product.**

*DIS Comment: Important research by Gwinnett (Am J Dent 1992;5:127-129) and Kanca (Quintessence Int 1992;23:39-41) showed that dentin bonding agents often bond more strongly to moist than to dry dentin. Since then the problem, however, has been to determine what degree of moisture in the dentin produces the strongest bond. Perhaps more relevant has been trying to discover how clinicians can most effectively establish the proper level of moisture in the dentin to maximize their bonding results. This article looked at a number of methods for drying dentin. Not surprisingly, it found that the two bonding products performed differently. Scotchbond MPA's ability to bond well to dry and to moist dentin is almost certainly a reflection of its water-based composition, which enables it to re-wet dentin that has been overdried. Prime & Bond 2.1, on the other hand, performed better on moist dentin because it contains acetone which has a strong affinity for water. Also important is the study's confirmation that overwet dentin compromises bonding, a conclusion previously reached by other researchers. Clinicians should be aware that the composition of a dentin bonding agent has a major influence over how well it performs when applied to moist or dry dentin.*

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### ***DOES THE TYPE OF RESIN-BASED CEMENT REALLY MATTER?***

A clinical evaluation of ceramic inlays bonded with different luting agents. Gemalmaz D, Özcan M, Alkumru HN. J Adhesive Dent 2001;3:273-283.

Various esthetic restorative materials can be used for restoring posterior teeth. Resin composites, when placed in properly selected cases and bonded with a well-performing bonding agent, can serve well for

many years. Ceramic materials are also commonly used for the restoration of various classes of preparations in posterior teeth. This study evaluated the performance of ceramic inlays according to the resin-based cement used to lute them. Forty-five Ducera LFC (Ducera, Rosbach, Germany) ceramic inlays were fabricated and used to restore posterior inlay preparations, the majority (89%) of which were moderate-size Class IIs. After application of Syntac bonding agent (Ivoclar Vivadent), the inlays were cemented with one of three resin-based cements: Variolink, high viscosity (Ivoclar Vivadent), Enforce (Dentsply/Caulk), or Geristore (Den-Mat). Variolink and Enforce are standard resin cements while Geristore is a multi-purpose resin-based luting agent that has been modified by the addition of fluorosilicate glass and polycarboxylic acid. The restorations were evaluated for a period of from 3 to 46 months using modified USPHS criteria. Periodontal indices were also measured. The researchers found that the fracture rates for Variolink, Enforce, and Geristore were 13%, 13%, and 33%, respectively. There was a high rate of early bulk fracture observed for inlays luted with Geristore. Geristore-luted inlays also showed a greater deterioration of marginal adaptation over time. All inlays, regardless of the type of luting cement that was used, exhibited acceptable color match and surface roughness scores during the evaluation period. For all groups, secondary caries was low. **The authors concluded that the use of the modified resin-based cement, Geristore, resulted in a higher fracture rate under the conditions of the study than did the traditional resin cements, Variolink and Enforce.**

*DIS Comment: As with most clinical studies, especially those that are designed to evaluate long-term performance of a material or technique, this study suffered from an increasing drop off of patient recalls as the study progressed. Although 45 restorations were placed and evaluated at baseline, the number dropped to 17 by the end of 3 years. It is important to note that Geristore, the product used to cement the inlays that had the highest fracture rates, differs compositionally from Variolink and Enforce. While the latter two are purely resin cements, Geristore is a resin that has been modified to include some glass-ionomer components. The authors of this study hypothesized that it is its modified composition that may have contributed to the poorer performance exhibited by inlays cemented with it.*

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### **DOES NIGHTGUARD VITAL BLEACHING AFFECT BONDING?**

The effect of elapsed time following bleaching on enamel bond strength of resin composite. Cavalli V, Reis AF, Giannini M, Ambrosiano GMB. Oper Dent 2001;26:597-602.

Nightguard vital bleaching is a treatment commonly requested by patients for whitening discolored teeth. With the growing demand for esthetic dentistry in general, situations are frequently encountered in which some type of bonding procedure is performed soon after the completion of nightguard bleaching. The authors of this study evaluated the effects of different concentrations of carbamide peroxide bleaching gels and post-bleaching times on the bond strength of resin composite to enamel. The buccal and lingual enamel surfaces of extracted human third molars were exposed to two bleaching products at one of two concentrations (Opalescence [Ultradent] 10% and 20% and Whiteness [FGM Produtos Odontológicos] 10% and 16%) for 6 hours each day for 10 consecutive days. At one day, 1 week, 2 weeks, and 3 weeks after bleaching was finished, Z100 resin composite was bonded to the enamel surfaces using Scotchbond Multipurpose Adhesive (both from 3M ESPE). Twenty-four hours after bonding, the shear bond strength of the specimens was measured. Results indicated that, compared to a control (unbleached) group, the 1-day, 1-week, and 2-week post-bleaching groups had significantly lower bond strengths. Only at three weeks after bleaching did the bond strengths return to that of the unbleached group. Neither the specific bleaching agent nor its concentration affected the results. **The researchers concluded that the tested bleaching products had an adverse effect on bond strength of resin composite to enamel and that the effect depended on the amount of time that had elapsed following the completion of the bleaching treatment.**

*DIS Comment: This study confirms what others have shown: that nightguard vital bleaching products can decrease the bond strength of adhesive materials applied to treated enamel. This is important to know because clinical situations arise where bonding is performed following bleaching. For example, bleaching is usually done prior to the replacement of failing resin composite restorations. Also, bleaching may be*

done prior to the placement of porcelain veneers. If the bond strength is adversely affected, as this study showed it is, the resulting bonded restorations may exhibit more leakage, sensitivity, and marginal staining. A good general rule is to allow several weeks to elapse following bleaching before any adhesive procedure is performed.

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### **SELECTING A SHADE FOR RESIN-MODIFIED GLASS IONOMERS**

Color stability of a resin-modified glass ionomer cement. Yap AUJ, Sim CPC, Loganathan V. Oper Dent 2001;26:591-596.

Selecting the appropriate shade for a restorative material can be a challenge, especially if the material changes after it has been placed. This research attempted to determine the color stability over time of one brand of a resin-modified glass-ionomer restorative material, Fuji II LC from GC America. The researchers made small square samples of five shades (A2, A3, A4, B3, and C4) of Fuji II LC and used a laboratory device to measure their shade at one day, one week, one month, three months, and six months. Between measurements, the samples were stored in distilled water at 37°C. Analysis revealed that Fuji II LC changed color over time and that the degree of change was dependent on the particular shade. For all the shades, the largest color change occurred between one day and one week. The lightest shades (A2 and A3) exhibited the greatest change. Lastly, all shades (except B3) became significantly darker by 6 months. **Based on these findings, the authors recommended that clinicians use a shade lighter than that of the original tooth when placing Fuji II LC.**

*DIS Comment: If a restorative material changes shade after it has been placed, it is extremely important that we have some idea as to its tendency to become lighter or darker. This article does all clinicians a favor by attempting to determine if a resin-modified glass-ionomer is color stable after it has been placed. Although the study evaluated only one brand of resin-modified glass ionomer, its findings are consistent with those of an earlier study (Oper Dent 1996;21:73-80). In that study, other researchers evaluated the color change of Fuji II LC as well as Vitremer (3M ESPE) and, based on their findings, also recommended that one shade lighter than that of the involved tooth be used for the resin-modified glass ionomer.*

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### **WHICH BONDING AGENTS BOND BETTER: THE SIMPLIFIED OR THE MULTI-STEP?**

Microtensile bond strength of eleven contemporary adhesives to dentin. Inoue S, Vargas MA, Abe Y, Yoshida Y, Lambrechts P, Vanherle G, Sano H, Van Meerbeek B. J Adhesive Dent 2001;3:237-245

Although all dentin bonding agents use the same process for bonding (etching with an acidic solution, priming with a hydrophilic monomer, bonding with a partially filled or unfilled resin) they are formulated quite differently. Some are provided as three separate components and are known as Three-Step Total-Etch adhesives. Others are two components: a combined etchant/primer and an adhesive, known as a Two-Step Self-Etch adhesive; or an etchant with a combined primer/adhesive, also called Two-Step Total-Etch adhesives. Some of the more recent products are provided as two solutions that are combined (Prompt L-Pop 2, 3M ESPE; One-Up Bond F, Tokuyama/J. Morita) or as a single solution with an activator (Touch & Bond, Parkell). These products etch, prime, and bond with one solution that is applied to both dentin and enamel. They go by names such as "single solution" and "all-in-one" adhesives but are perhaps more properly termed One-Step Self-Etch products. The basic question that the authors of this article attempted to answer was which of these various formulations bonds the best. The authors used a microtensile bond strength test that evaluated eleven different bonding products to determine if there was a trend shown by the various formulations. They found that the three-step total-etch product, OptiBond FL (3M ESPE), performed significantly better than all the other products. The one-step self-etch products evaluated in the study (Prompt L-Pop 2, One-Up Bond F) had the lowest bond strength of all the products. **The authors concluded that there exists some concern about the consistency of bonding effectiveness with some self-etch adhesives.**

*DIS Comment: With the various forms of bonding agents and the numerous terms used to identify them, dentin bonding products have become more confusing than ever. Although the manufacturers continue to work to simplify their application, it has become more of a challenge for the average clinician to keep them straight. This article is a good one for two reasons. First, it provides a succinct way of classifying the different bonding products. The table below lists them and describes them as discussed by the authors.*

Type	# of Solutions applied to Tooth	Components	Examples
Three-Step Total-Etch	3	etchant, primer, adhesive	OptiBond FL (SDS/Kerr) All-Bond 2 (Bisco) Scotchbond MPA (3M ESPE) PermaQuik (Ultradent)
Two-Step Total-Etch	2	etchant, primer/adhesive	OptiBond Solo (SDS/Kerr) Single Bond (3M ESPE) One-Step (Bisco) PQ1 (Ultradent) Excite (Ivoclar Vivadent)
Two-Step Self-Etch	2	self-etching primer, adhesive	Clearfil SE Bond (Kuraray)
One-Step Self-Etch	1	self-etching primer with adhesive	Prompt L-Pop 2 (3M ESPE) One-Up Bond F (Tokuyama) Touch & Bond (Parkell)

*The other reason this article is interesting is because it is one of a growing number of studies that have found that some self-etching products (as represented by Prompt L-Pop 2 and One-Up Bond F in this study) have a lower bond strength and/or produce more inconsistent bonding than other types of bonding agents. DIS testing has also confirmed a lower bond strength for Touch & Bond. The reason is not completely clear but may have to do with the acidity of the bonding agent and its interaction with the subsequently applied resin composite. Further research will be necessary to determine the exact cause.*

# GENERAL DENTISTRY

## 64-11 Illusion Universal Cementation System

(Project 01-29)

Illusion is a two-paste, dual-cured resin cement that has shades based on translucency/opacity rather than on the Vita shade guide. It is recommended by its manufacturer for the luting of esthetic porcelain and resin composite inlays, onlays, veneers, crowns, and fixed partial dentures. It can also be used to lute metal inlays, onlays, and crowns. An Illusion Kit contains three syringes of visible-light-cured base paste in shades Clear, Milky, and Opaque. A Clear Catalyst Paste is provided for the luting of indirect restorations where a dual-cured or chemically-cured cement is indicated. Three Water-Soluble Try-In Pastes in shades Clear, Milky, and Opaque are also included. Adding to the innovativeness of Illusion is a liquid Light-Cured Viscosity Modifier that allows the clinician to alter the viscosity of the cement. The chroma of the three shades can also be modified by using a liquid Light-Cured Color Modifier. Completing the kit are a syringe of Light-Cured Pink Block-Out Paste to neutralize dark underlying tooth structure and bottles of One-Step bonding agent, Porcelain Primer, Composite Primer, Porcelain Etch (4% hydrofluoric acid), and Uni-etch (32% phosphoric acid). The product is packaged in an unusual, fold-open plastic box where the cover serves as a stand. All components are held securely in the box. Written instructions are provided in booklet form and five graphics-containing instruction cards summarize product use.

### Manufacturer:

Bisco, Inc.  
1100 W. Irving Park Road  
Schaumburg, IL 60193  
(800) 247-3368  
(847) 534-6000  
(800) 959-9550 FAX  
[www.bisco.com](http://www.bisco.com)

### Suggested Retail Price:

\$310.00 Illusion Deluxe Starter Kit (product number REF C-32100K) contains:

- three 4-g syringes of Base Paste (shades Clear, Milky, and Opaque)
- one 4-g syringe of Dual-Cured Clear Catalyst Paste
- three 3-g syringes of Water-Soluble Try-In Pastes (shades Clear, Milky, and Opaque)
- one 1.5-g syringe of Light-Cured Color Modifier Paste
- one 1.5-g syringe of Water-Soluble Color Modifier Try-In Paste
- one 1.5-g syringe of Light-Cured Pink Block-Out Paste
- one 1.5-g syringe of Water-Soluble Pink Block-Out Try-In Paste
- one 6-mL bottle of Light-Cured Viscosity Modifier
- one 10-mL bottle of Composite Primer
- one 10-mL bottle of Porcelain Primer
- one 7-g bottle of Porcelain Etchant
- one 6-mL bottle of One-Step
- one 5-g bottle of 32% Uni-Etch with BAC
- accessories
- Technique Cards
- Instructions, MSDS

### Government Price:

\$263.50 Illusion Kit (product number and contents as listed above)

**ADVANTAGES:**

- + Kit contains all components necessary for cementation of esthetic restorations.
- + Features an innovative viscosity-modifier system.
- + While shorter than other resin cements, working time is long enough that users can mix and use the cement without rushing.
- + Setting time is relatively short which minimizes post-cementation chair time.
- + Pastes are easy to mix.
- + Very easy to clean excess cement from margins.
- + No post-treatment sensitivity reported during clinical-user evaluation.
- + Adequately radiopaque for detection on radiographs.
- + Acceptably thin film thickness.
- + Includes try-in pastes which users found helpful.
- + Cement and try-in pastes are color coded to allow easy differentiation between light activated and non-light activated ones.
- + Provided with effective, easy-to-use bonding agent.
- + Excellent price.
- + Expiration dates and lot numbers are provided for all items in kit.
- + Comes with well-done graphics instruction cards.
- + Recommended storage conditions are listed on box.
- + Packaged in innovative, fold-open plastic box.
- + Material Safety Data Sheet (MSDS) is included in kit.

**DISADVANTAGES:**

- Instructions do not describe some aspects of product use.
- Some users did not like color-modifier system and prefer standard pre-mixed shades better.
- Name for "milky" shade is nondescriptive and confusing.
- Product box is large which makes storage difficult.

**SUMMARY AND CONCLUSIONS:**

Illusion performed well in the laboratory and was well liked by clinical evaluators. It had an acceptable film thickness, appropriate working and setting times, and was adequately radiopaque. Clinical evaluators found it easy to mix and to clean-up from marginal areas. It comes with well-illustrated instruction cards that the evaluators appreciated and found useful. Esthetically, the cement performed well, and it is provided with an innovative method for altering the thickness (viscosity) of the cement which the users liked. Its color modifier was not as well accepted by the evaluators who expressed a preference for pre-mixed shades as found in other resin cements. Users should note that some aspects of product use are not discussed in the written instructions such as for how long the pastes should be mixed, the available working time, and the amount of time required for setting. The most highly rated characteristic of this product is the fact that it comes with all components necessary to accomplish the types of cementation for which it is recommended. The cement is also available at a price from 35 to 50 percent lower than that of several other popular resin cements. Based on its innovative features, inclusiveness, and low cost, **Illusion Universal Cementation System** is rated **Recommended** for use by the federal dental services.

(Col Charlton)

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**64-12 QUATTROcare****(Project 00-29)**

The QUATTROcare is the KaVo America Corporation's automatic handpiece maintenance and purging system. The tabletop unit is designed to clean, lubricate, and purge handpieces automatically in a sealed, front-loading chamber. KaVo states that the QUATTROcare can be used for virtually all high-speed, low-speed contra-angle, and straight handpieces as well as for air-driven scalers and air motors. KaVo claims that four handpieces can be serviced in the QUATTROcare simultaneously and that both high- and low-speed handpieces can be run during the same cycle. The QUATTROcare requires 120V, 50/60Hz, 20-amp

electrical service and a quarter-inch, 58 to 145-psi air line connection. The unit is 15.0"H X 13.8"W X 11.0"D and weighs 22 pounds.

**Manufacturer:**

KaVo America Corporation  
340 East Main Street  
Lake Zurich, IL 60047  
(888) 528-6872  
(847) 550-6800  
(847) 550-6825 FAX  
www.KaVousa.com

**Suggested Retail Price:**

\$2440 QUATTROcare (item 2104A)  
-QUATTROcare unit  
-Multiflex coupling  
-Power cable  
-Air hose  
-Additional O rings  
-QUATTROcare spray  
-Instructions for use

**Government Price:**

\$1374.84 QUATTROcare (contents as listed above)

**ADVANTAGES:**

- + Provides consistent, automatic cleaning and lubrication of handpieces and/or attachments.
- + Reduces the human factor in handpiece maintenance.
- + Efficiently processes four handpieces and/or attachments simultaneously in 80 seconds.
- + Does not degrade handpiece performance.
- + Easy to integrate into existing dental facilities.
- + Set-up is simple and fast before initial use.
- + Easy to learn to use.

**DISADVANTAGES:**

- Processing non-KaVo handpieces in the unit may void handpiece warranty.
- Supplied air hose does not readily adapt to standard quick-connect air fittings.
- The formatting of multi-language instructions can be confusing.
- More expensive than standard manual method of cleaning and lubricating handpieces.

**SUMMARY AND CONCLUSIONS:**

The QUATTROcare is an automated handpiece cleaning and lubrication unit that provides consistent and efficient processing of up to four handpieces and/or attachments simultaneously. The product met all electrical safety requirements and integrated well into existing federal dental facilities. Clinical users appreciated the QUATTROcare's efficient processing of dental handpieces and reported that it was easy to operate, despite its somewhat confusing operating instructions. Evaluators appreciated the uniform cleaning and lubrication that the QUATTROcare provides. Since only KaVo's proprietary cleaner/lubricant can be used in the QUATTROcare, processing non-KaVo handpieces in the unit may void their warranty. The **QUATTROcare** is **Recommended** for use by federal dental facilities that use KaVo dental handpieces.

(Lt Col Roberts)

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## 64-13 LumaCure Cordless Curing Light

(Project 01-16)

The LumaCure Cordless Curing Light uses focused Light Emitting Diode (LED) technology to polymerize visible-light-activated materials. Compared to standard halogen bulbs, LED units use semiconductors, in most cases gallium nitride, to produce a narrower spectral range that is closer to the absorption spectrum of the camphorquinones that initiate resin polymerization. Due to the combination of this more specific spectral range and the LED's superior energy conversion rate compared to halogen lamps, the LumaCure is purported to generate sufficient intensity for polymerization using rechargeable Ni-MH (Nickel-Metal-Halide) batteries rather than line voltage. Without bulky power units and cords, the LumaCure is portable, lightweight, and very convenient to use. Two hundred 12-second exposures are possible before the unit needs to be recharged, and three hours are required to fully charge a completely discharged unit. Neither the LumaCure unit nor its tips can be autoclaved, but they may be disinfected. Disposable plastic sheaths are provided for barrier protection. The on/off switch and activation button are conveniently located on the unit. Three different tips are available: a 90° tip with 7-LEDs, a 45° tip with 7 LEDs, and a 45° tip with 4 LEDs. The LumaCure Cordless Curing Light is 7.5"L X 1.5"W X 1.0"D and weighs 7 ounces. The charging unit is available in both 120V and 220V models and is CE certified.

### **Manufacturer:**

LumaLite, Inc.  
2810 Via Orange Way, STE B  
Spring Valley, CA 91978  
(800) 400-2262  
(619) 660-5410  
(619) 660-5459 FAX

### **Suggested Retail Price:**

\$1795.00 LumaCure Cordless Curing Light, includes:  
-handpiece  
-interchangeable/rotatable 7-LED 90° curing tip  
-battery charger stand  
-power supply  
-instruction manual  
-50 disposable barrier sheaths  
-resin tester disk  
-carrying case.

### **Government Price:**

\$1615.00 LumaCure Cordless Curing Light (contents as listed above)

### **ADVANTAGES:**

- + Offers the conveniences of portability and lightweight.
- + Maintained constant irradiance for a minimum of two hundred 12-second exposures.
- + Unit is simple and easy to use.
- + Curing tip swivels 360 degrees to facilitate intraoral access.
- + Is CE marked.
- + Very quiet.
- + Requires little counter space for storage.

### **DISADVANTAGES:**

- Does not adequately cure resin composites using their manufacturers' recommended times.
- Required more time than a halogen light unit to adequately polymerize resin composites.
- Is considerably more expensive than halogen curing lights.
- Curing tips are not heat sterilizable.

- Disposable barrier sleeves reduce light output by 10%.
- Has only one exposure time setting (12 seconds).

**SUMMARY AND CONCLUSIONS:**

The LumaCure Cordless Curing Light is a lightweight, portable curing light that incorporates the latest Light Emitting Diode (LED) technology. Clinical evaluators reported that the light was easy to operate and appreciated its portability and ease of use. The Nickel-Metal-Hydride battery effectively provided consistent output for up to two hundred 12-second exposures without needing to be recharged. Due to the LumaCure's design, it is not possible to heat sterilize its tip or handpiece. Therefore, disposable barrier sleeves are recommended to prevent cross contamination between patients. Unfortunately, the sleeves provided by the LumaLite company reduced the light's already marginal light output by 10%. DIS testing found that the LumaCure Cordless Curing Light did not adequately polymerize resin composite in the time called for by the manufacturer. In the instructions for the LumaCure, the user is instructed to use the exposure time recommended by the resin composite's manufacturer. When using a halogen light, that is usually 40 to 60 seconds for a 2-mm-thick increment. However, DIS testing found that the LumaCure required 48 seconds and 108 seconds to polymerize the hybrid composite (Z-100) and the microfill composite (Silux Plus), respectively. The **LumaCure Cordless Curing Light** is rated **Marginal** for use by the federal dental services.

(Col Leonard)

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## **64-14 Accu-Dent System 1 Impression System**

**(Project 01-01)**

The Accu-Dent System 1 is a new impression system for complete dentures from the Ivoclar Vivadent company. The system uses the Accu-Gel impression materials, which are chemically compatible, irreversible hydrocolloid materials that differ in viscosity. The low-density (syringe) material is injected into the vestibular areas while the high-density (tray) material is used in the tray to support the syringe material and form a type of "custom tray" in the mouth. The system comes with special, autoclavable, plastic, perforated impression trays that Ivoclar Vivadent claims can be easily modified for special cases. The Accu-dent impression materials are said to be accurate not only for preliminary impressions but also for final impressions for denture fabrication.

**Manufacturer:**

Ivoclar Vivadent, Inc.  
175 Pineview Drive  
Amherst, NY 14228  
(800) 533-6825  
(716) 691-0010  
FAX (716) 691-2285  
[www.ivoclarvivadent.us.com](http://www.ivoclarvivadent.us.com)

**Suggested Retail Price:**

\$275.00 Accu-Dent System, includes:

- 15 Accu-Dent Trays (5 maxillary, 10 mandibular)
- 1 box (18 packages) of Syringe Accu-Gel
- 1 box (18 packages) of Tray Accu-Gel
- 1 plastic tray storage box
- 2 syringes
- 1 water-measuring vial
- 1 thermometer
- 1 tray caliper
- 1 tray holder
- 1 System 1 complete procedure booklet

\$19.00 Syringe Accu-Gel Refill (24 packs, 5 gm each), item number 820002  
\$28.50 Tray Accu-Gel Refill (24 packs, 20 gm each), item number 820003

**Government Price:**

\$165.00 Accu-Dent System 1 (contents as listed above)

\$11.40 Syringe Accu-Gel Refill (as listed above)

\$17.10 Tray Accu-Gel Refill (as listed above)

**ADVANTAGES:**

- + Kit comes with all items needed for making irreversible hydrocolloid impressions.
- + Is a suitable impression material for the fabrication of immediate dentures.
- + Impression trays were rated highly by clinical evaluators.
- + Excellent for preliminary impressions.
- + Easy to mix and dispense.
- + Well tolerated by patients.
- + Acceptable working and setting times.
- + Meets ANSI/ADA Specification No. 18 requirement for gypsum compatibility and detail reproduction for irreversible hydrocolloid impression materials.
- + Instructions contain adequate detail, are easy to read, and complete.
- + Compact packaging.

**DISADVANTAGES:**

- Does not meet ANSI/ADA Specification No. 19 requirement for gypsum compatibility and detail reproduction for elastomeric impression materials.
- Impression material is not suitable for the fabrication of complete denture master casts.
- Tray material is too viscous.
- Requires water cooler than room temperature for mixing.
- Impression material more expensive than other commonly-used irreversible hydrocolloid products.

**SUMMARY AND CONCLUSIONS:**

The Accu-Dent System 1 is an irreversible hydrocolloid-based impression system that is recommended by the manufacturer for producing complete denture master casts. The Accu-gel impression materials met ANSI/ADA requirements for alginate materials but failed to meet the higher detail reproduction and gypsum compatibility standards of ANSI/ADA No. 19 for typical final impression materials. Clinical evaluators reported that the material was easy to mix and dispense. Patients tolerated the material well, in part because it did not flow out of the trays as much as traditional irreversible hydrocolloids. Clinical users found the impression trays very useful and appreciated their customized design which made it easier to make successful impressions. The system was found to be acceptable for preliminary casts and for the fabrication of complete immediate dentures. However, prosthodontic evaluators attempted to use the Accu-Gel impression materials for final impressions but discontinued its use after experiencing clinical problems. The **Accu-Dent System 1** is rated **Acceptable** for use by the federal dental services.

(Lt Col Roberts)

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## **64-15 Accu-Dent System 2 Impression System**

**(Project 01-02)**

The Accu-Dent System 2 is a new impression system for removable partial dentures. The system uses the Accu-Gel impression materials, which are chemically compatible, irreversible hydrocolloid impression materials that differ in viscosity. The low-density (syringe) material is injected into the vestibular and dentate areas while the high-density (tray) material is used in the tray to support the syringe material and form a type of "custom tray" in the mouth. The system comes with special, autoclavable, plastic, perforated impression trays that Ivoclar Vivadent claims can be easily modified for special cases. The Accu-dent

impression materials are said to be also indicated for immediate dentures, orthodontic impressions, athletic mouthguards, occlusal splints, and bleaching trays.

**Manufacturer:**

Ivoclar Vivadent, Inc.  
175 Pineview Drive  
Amherst, NY 14228  
(800) 533-6825  
(716) 691-0010  
(716) 691-2285 FAX  
www.ivoclarvivadent.us.com

**Suggested Retail Price:**

- \$275.00 Accu-Dent System 2, includes:
  - 12 Accu-Dent Trays (6 maxillary, 6 mandibular)
  - 1 box (18 packages) of Syringe Accu-Gel
  - 1 box (18 packages) of Tray Accu-Gel
  - 1 plastic tray storage box
  - 2 sterilizable 35-cc impression syringes
  - 1 water measuring vial
  - 1 thermometer
  - 2 Pre-Sure Tip soft applicators
  - 2 Pre-Sure Tip medium applicators
  - 1 tray holder
  - 1 Finger Grip Extender
  - 1 System 2 complete procedure booklet
  
- \$17.00 Syringe Accu-Gel Refill (24 packs, 5 gm each) item number 820021
- \$27.50 Tray Accu-Gel Refill (24 packs, 20 gm each) item number 820022

**Government Price:**

- \$165.00 Accu-Dent System 2 (contents as listed above)
  
- \$10.20 Syringe Accu-Gel Refill (as listed above)
- \$16.50 Tray Accu-Gel Refill (as listed above)

**ADVANTAGES:**

- + Kit comes with all items needed for making irreversible hydrocolloid impressions.
- + Is a suitable impression material for the fabrication of removable partial dentures, nightguards and sleep apnea appliances.
- + Impression trays were rated highly by clinical evaluators.
- + Easy to mix and dispense.
- + Well tolerated by patients.
- + Acceptable working and setting times.
- + Meets ANSI/ADA Specification No. 18 requirement for gypsum compatibility and detail reproduction for irreversible hydrocolloid impression materials.
- + Instructions contain adequate detail, are easy to read, and complete.
- + Compact packaging.

**DISADVANTAGES:**

- Impression material is considerably more expensive than other commonly-used irreversible hydrocolloid impression materials.

**SUMMARY AND CONCLUSIONS:**

The Accu-Dent System 2 is an irreversible hydrocolloid-based impression system that is primarily recommended by the manufacturer for producing removable partial denture master casts. The Accu-gel impression materials met ANSI/ADA requirements for alginate materials and exhibited acceptable working and setting times. Clinical evaluators reported that the material was easy to mix and dispense. Patients tolerated it well, in part because it did not flow out of the trays as much as traditional irreversible hydrocolloids. Clinical users found the impression trays very useful and appreciated their customized design which made it easier to make successful impressions. The Accu-Dent System 2 was found to be excellent for making RPD final impressions and in the fabrication of nightguards and obstructive sleep apnea appliances. The main disadvantage is that the Accu-Gel impression materials are much more expensive than traditional irreversible hydrocolloid materials. The **Accu-Dent System 2** is rated **Acceptable** for use by the federal dental services.

(Lt Col Roberts)

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**64-16 Irix 70-C Mobile X-ray Unit****(Project 00-38)**

The Irix 70-C mobile intraoral x-ray unit consists of a tubehead, extension arm, and control panel that are mounted vertically to a framed wheelbase. This configuration allows dental workers to maneuver the unit between operatories. The product has a microprocessor-controlled timer that automatically adjusts exposure times when the clinical area is selected on a tooth chart touch pad located on the control panel. The Irix 70-C is a 70-kVp, 8-mA unit with a 0.7 mm by 0.7 mm focal point. The standard beam-limiting device is an 8-inch long cylinder but an optional 12-inch length is also available. The extension arm is available in three lengths: 54 inches, 65 inches, or 74 inches. The x-ray unit is available for 110V/10A or 220V/6.3A power lines, is UL approved and is 37½" D X 21½" W X 75½" H. The manufacturer claims that the system exceeds international standards for radiation safety with up to 95 percent less scatter radiation than the maximum limit allowed by federal agencies. The tubehead and timer have a two-year warranty.

**Manufacturer:**

Trextrophy  
37 Apple Ridge Road  
Danbury, CT 06810  
(800) 667-1780  
(203) 207-4575  
(203) 207-4546 FAX  
[www.trophy-imaging.com](http://www.trophy-imaging.com)

**Suggested Retail Price:** \$4,832.00

**Government Price:** \$2,899.00

**ADVANTAGES:**

- + Performed reliably during clinic-user evaluation.
- + Extension arm is stable.
- + Has an ample range of time settings.
- + Cone length is appropriate.
- + Has a lightweight, low-profile tubehead.
- + Unit is very stable with no reports of tipping.
- + Produced radiographs of acceptable quality.
- + Is compatible for use with digital sensors.
- + User-friendly instructions.

**DISADVANTAGES:**

- Extension arm did not have full (i.e., adequate) range of motion.
- Unit was difficult to maneuver around the dental chair.

**SUMMARY AND CONCLUSIONS:**

The Irix 70-C mobile x-ray unit is mounted on a framed wheelbase that allows the user to move it between dental treatment rooms. The unit functioned reliably during the test period and produced radiographs of acceptable quality. The extension arm provided stable positioning for the tubehead, and there were no reports of the unit tipping. The main disadvantages were difficulty in maneuvering the unit around the dental chair and restricted arm reach. The **Irix 70-C mobile x-ray unit** is rated **Acceptable** for use by the federal dental services.

(Col Bartoloni)

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**64-17 Heliomolar HB Resin Composite**

**(Project 01-35)**

Heliomolar HB Resin Composite is an esthetic, high-viscosity, packable, light-cured restorative material designed for use in posterior teeth (Classes I and II). The product joins Micronew (Bisco) as one of the few “reinforced” microfills that have a higher viscosity than traditional microfills. According to the manufacturer, this is accomplished by using a special rheologic modifier. One important claim made for Heliomolar HB is that its thicker consistency makes it easier for clinicians to establish proper interproximal contacts. Among the other advantages claimed by Ivoclar Vivadent are excellent polishability and shade matching, adequate radiopacity, and high strength.

Heliomolar HB is filled 66.7% by weight (46% by volume) with silicon dioxide and ytterbium trifluoride particles. It is available in a total of 9 shades (7 of which are keyed to the Vita shade guide and two enamel shades). The product is available in syringes and in wide-mouth capsules (Cavifils). Instructions call for placing the material in 1- to 2-mm increments and using a 20-second light curing time. Among other items, the kit includes a dispenser gun, Ivoclar Vivadent’s unit-dose bonding agent (Excite), and a graphics-containing summary instruction card.

**Manufacturer:**

Ivoclar Vivadent, Inc.  
175 Pineview Drive  
Amherst, NY 14228  
(800) 533-6825  
(716) 691-0010  
(716) 691-2285 FAX  
[www.ivoclarvivadent.us.com](http://www.ivoclarvivadent.us.com)

**Suggested Retail Price:**

\$265.00 Heliomolar HB Cavifil Intro Pack (item no. 560193AN), contains:  
-sixty 0.25-g Cavifils, 10 each of shades A1, A2, A3, 5 each of shades B1, B2, C2, D2, WE, GE  
-two 1.6-g syringes of Heliomolar Flow, shade A3  
-10 Excite Soft Touch Unit Dose Vessels  
-one 2-g syringe of Total Etch  
-9 Astropol Finishers and Polishers  
-1 P-1 metal placement/contouring instrument  
-accessories

**Government Price:**

\$116.77 Heliomolar HB Cavifil Intro Pack (item number and contents as listed above)

**ADVANTAGES:**

- + Is the least expensive resin composite yet evaluated by DIS.
- + Users rated the product highly for polishability and overall esthetics.
- + The nine available shades were judged as adequate by the evaluators.
- + Resin's thicker consistency helps the user place restorations with good (i.e., tight) proximal contacts.
- + Does not slump after placement.
- + Is adequately radiopaque for easy radiographic detection.
- + Is packaged with Excite bonding agent, rated "Recommended" by DIS.
- + Syringes of Heliomolar flowable composite are included in kit.
- + Provided with user-friendly graphics instruction card illustrating use of all components.
- + Material Safety Data Sheet (MSDS) is provided with the product.

**DISADVANTAGES:**

- Instructions call for a 20-second light exposure, which is inadequate for proper polymerization.
- Clinical evaluators found the composite difficult to manipulate after placement.
- Not as hard as Micronew (another "reinforced" microfill).
- Diametral tensile strength was no greater than that measured for three other microfills.
- Kit comes with scant supply of dentin bonding agent.
- Expiration date is not printed on individual Cavifils.

**SUMMARY AND CONCLUSIONS:**

Overall, Heliomolar did well in clinical-user testing. Its polishability, esthetics, and shade matching were rated highly by users. Its thicker consistency made it a good choice for restorations where establishing adequate proximal contacts is important. A few evaluators felt it was hard to sculpt after placement, presumably because its greater thickness made it difficult to draw the resin in thin layers into certain areas of the preparation. In general, even though it is labeled a "reinforced" microfill, its physical properties were comparable, but no better than those of traditional microfill resin composites. Unlike nearly all other microfill resin composites currently on the market, Heliomolar HB has an excellent degree of radiopacity which makes it easy to detect radiographically. It is important that clinicians know that Heliomolar HB's recommended light-exposure time (20 seconds) is inadequate. To be safe, users should place it in layers no thicker than 2 mm and use a 40-second exposure time. Assuming clinicians use a minimum of 40 seconds for light activation, **Heliomolar HB Resin Composite** is rated **Acceptable** for use by the federal dental services.

(Col Charlton)

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**64-18 Touch & Bond****(Project 01-41)**

Touch & Bond is a self-etching, single-solution, light-activated bonding agent that consists of one bottle and small, blue, sponge "activator" pledgets. The acetone-based liquid contains the acidic monomer 4-META (4-methacryloxyethyl trimellitate anhydride, 13% concentration), which serves as an etchant and primer. 4-META and other monomers in the liquid contribute to the formation of a hybrid layer. The pledgets are impregnated with the co-initiator (sodium p-toluenesulfinate) that initiates a polymerization reaction when combined with the 4-META-containing liquid. After application, a standard halogen curing light is used to complete the polymerization. Touch & Bond is intended for simple bonding (i.e., bonding of resin composite to dentin and roughened/cut enamel) and can be applied to either dry or moist dentin and enamel. It is not recommended for direct pulp capping or amalgam bonding.

To apply Touch & Bond, an activator pledget is placed in a dampen dish or in the provided mixing well and wetted with Touch & Bond liquid. The pledget is stirred in the liquid to ensure proper mixing, and the pledget is then used to apply the product. Alternatively, a small disposable applicator (provided) can be used to place the activated bonding agent. The tooth surface is wetted for 20 seconds and then air dried for 3 to 5 seconds. Any remaining liquid is applied to the tooth and air dried. The surface is then light

activated for 10 seconds.

Touch & Bond comes with an innovative one-piece plastic tray that holds the bottle upright and, in a separate well, contains the activator pledgets. A sliding tray cover is used to cover the pledgets. The product is packaged in a small paper box that also contains a mixing well, disposable plastic applicators, product instructions, and a Material Safety Data Sheet.

**Manufacturer/Distributor:**

Parkell  
155 Schmitt Blvd  
PO Box 376  
Farmingdale, NY 11735  
(800) 243-7446  
(631) 249-1134  
(631) 249-1242 FAX  
www.parkell.com

**Suggested Retail Price:**

\$96.00 Touch & Bond (item number S280CT), includes:  
-one 5.5-mL bottle of Touch & Bond liquid  
-175 activator pledgets  
-50 Adjustable Precision Applicators (i.e., microbrushes)  
-organizer tray

**Government Price:** same as retail

**ADVANTAGES:**

- + Requires few steps for application.
- + Is fast to apply.
- + Can be applied to dry or moist dentin.
- + No reports of post-placement sensitivity.
- + No offensive odor.
- + Expiration date and lot number are stamped on bottle.
- + Application process is shown pictorially on back of product box.
- + Recommended storage conditions are provided on instruction sheet.
- + Packaged in a very small, space-saving box.
- + Is shipped with a Material Safety Data Sheet (MSDS).

**DISADVANTAGES:**

- Can only be used for one purpose (i.e., bonding direct resins to enamel and dentin).
- Bond strength was significantly lower than the values measured for a number of dentin bonding agents recently evaluated by DIS.
- Some instances of gingival irritation were noted during the evaluation.
- Most users did not like using the pledgets for product application.
- Instructions do not address some aspects of product application technique.
- Not available in a unit-dose form.

**SUMMARY AND CONCLUSIONS:**

Touch & Bond is one of the few bonding products that etch, prime, and bond with one liquid. Because it is a one-liquid product, it is easy to learn to use and is fast to apply (i.e., 71 seconds). The product uses innovative pledgets to activate the bonding agent; this precludes the need for multiple bottles and mixing. Unfortunately, the evaluators did not like the pledgets because they were easy to lose from the kit and were difficult to use for precise and controlled application. An alternative application method mentioned in the

instructions using small brushes included in the kit was much better received. Touch and Bond has very limited clinical applications and should not be viewed as a multi-substrate bonding agent. Some instances of gingival irritation were noted when the product was allowed to contact gingival tissues. As with other self-etching primer products, the dentin need not be moist when it is applied. This is advantageous because many clinicians are unsure of the degree of moisture dentin should have at the time of bonding. For the simple bonding procedures for which it is intended, **Touch & Bond** is rated **Acceptable** for use by the federal dental services.

(Col Charlton)

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## 64-19 Hawe PerioStar 3000

(Project 01-04)

The Hawe PerioStar 3000 is an electrically-powered countertop device designed for sharpening scalers as well as universal and Gracey curette periodontal instruments. The unit has a horizontal arm with a clamp and a positioning device that purportedly accurately positions the instrument for sharpening. The arm can be extended along an arch to facilitate access to the instrument's edges. A second flexible plastic arm positions the sharpening stone. The sharpening stone arm is manually moved in a circle around the instrument to gain access to the instrument's edges for sharpening. The manufacturer claims the device has several advantages compared to conventional sharpening stones. First, it purportedly reproduces predictable results with minimal effort and time, regardless of the operator's skill level. Also, the Hawe PerioStar 3000 is said to facilitate precise sharpening of instruments that are usually difficult to manually sharpen correctly, such as Gracey curettes. The unit's dimensions is 10"H X 10½"W X 11"D and weighs four pounds (without attached accessories). The PerioStar 3000 requires 15-20 amps single-phase, 120VAC current.

### **Manufacturer:**

Hawe Neos Dental SA  
Zona Strecce  
6934 Bioggio  
Switzerland  
(800 ) 537-7123 (SDS/Kerr)  
[www.hawe.ch](http://www.hawe.ch)

### **Distributor:**

Patterson Dental Company  
1031 Mendota Heights Road  
Saint Paul, MN 55120  
(800) 328-5536  
(651) 686-1600  
[www.pattersondental.com](http://www.pattersondental.com)  
Product item #357-9117

Government facilities can contact Mark T. Spilman (PerioStar Specialist) for information at (610) 489-7035, (610) 489-8915 FAX, or via e-mail at [mtspilman@aol.com](mailto:mtspilman@aol.com)

### **Suggested Retail Price:**

\$895.00 Hawe Neos PerioStar 3000 Portable Countertop Unit, includes:

- 1 AC Adapter
- 1 accessory kit that includes:
  - 1 white superfine sharpening stone
  - 1 pink medium sharpening stone
  - 1 tube of Sharpening Paste
  - 1 Protective Plastic Cap

- 1 acrylic testing rod
- 2 magnetic crossbeams
- 1 instruction manual
- 1 laminated Quick Use Guide
- 1 8-minute instruction videotape

Replacement Items:

- \$45.95 -superfine sharpening stones (2 per package)
- \$39.95 -medium sharpening stones (2 per package)
- \$39.95 -coarse sharpening stones (2 per package)
- \$19.95 -Sharpening Paste (2 tubes)
- \$15.50 -Acrylic Testing Rods (5 per package)
- \$10.50 -Protective Cap (5 per package)
- \$69.95 -magnetic crossbeams (5 per package)

**Government Price:**

\$650.00 Have Neos PerioStar 3000 Portable Countertop Unit (contents as listed above)  
Replacement items are same price as retail.

**ADVANTAGES:**

- + Produces a predictable, highly-polished, precise, cutting edge.
- + Innovative concept compared to conventional sharpening devices.
- + Is well-designed, portable, and lightweight.
- + Easy to set up, operate, and clean.
- + Functions reliably.
- + Operating instructions are easy to read.
- + Laminated Quick Use Guide is easy to use.
- + Well-produced instructional video enhances the machine's usability.
- + Short learning curve.
- + Minimizes operator variability during sharpening.
- + Magnetic crossbeam assists in the proper alignment of instrument to be sharpened.
- + Acrylic testing rod confirms instrument sharpness.
- + Two sharpening stones are easily distinguished by their color coding.
- + Sharpening stones are autoclavable.
- + Has one-year warranty.

**DISADVANTAGES:**

- Is more expensive than conventional sharpening methods/products.
- Operating instructions lack electrical requirement specifications.
- Clear protective safety cap for instruments is difficult to see.
- Is not designed for use during patient care.
- Small accessory parts can easily become lost.
- No Material Safety Data Sheet (MSDS) is provided with the sharpening paste.
- Can not use petroleum-based sharpening pastes/lubricants on sharpening stones because it may degrade their sharpening efficiency.
- Government pricing is not available for replacement or accessory kit items.
- Replacement and accessory items are available only in bulk quantities of two or five.
- The coarse sharpening stone must be purchased separately.
- Warranty information is not provided in packaging.

**SUMMARY AND CONCLUSIONS:**

The Have PerioStar 3000 received high marks for its innovative concept, design, and predictability in sharpening instruments. Its easy-to-read operating instructions, laminated Quick Use Guide, and concise

instructional video shorten the learning curve and reduced human variability in instrument sharpening. The magnetic crossbeam functioned exceptionally well in helping to align instruments for sharpening, and the yellow acrylic testing rod was efficient when checking sharpness. Most sharpening can be done in a short period of time with the two color-coded sharpening stones that are provided. Setup and operation are quick and easily accomplished in four simple steps with no significant time difference noted between use of a conventional sharpening device and this unit. The sharpening stones are autoclavable, however the manufacturer recommends using a nonpetroleum-based sharpening paste since oil-based lubricants may degrade stone function after sterilization. The clear protective safety cap that is placed over the opposite exposed end of the instrument to be sharpened, while difficult to see, functioned satisfactorily. This sharpening unit is best suited for use in either a central instrument area or a Dental Instrument Processing Center. The **Hawe PerioStar 3000** is an excellent alternative to hand-held and rotary sharpening devices and is rated **Recommended** for use by the federal dental services.

(TSgt Sutter)

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## 64-20 Heliodont DS Mobile X-ray Unit

(Project 00-33)

The Heliodont DS mobile intraoral x-ray unit consists of a tubehead, position-indicating device (i.e., cone), extension arm, and control panel that are mounted vertically to a framed wheelbase. This configuration is designed to allow dental workers to maneuver the unit between operatories. The Heliodont DS is said to contain a multiphase generator that produces direct current (DC) electron flow, which the manufacturer claims reduces patient radiation by 20 percent and ensures sharp contours and fine detail. The device is described as a 60-kV, 7-mA unit with a 0.7-mm focal point. The standard position-indicating device is 8-inches long, but an optional 12-inch length is also available. The flexible extension arm is also available in two lengths: 60 inches and 71 inches. The exposure settings are selected with the aid of a multifunctional control knob that features patient/tooth icons. Exposure times can be individually selected to suit all standard commercially available film speed categories, and is purported to be compatible with digital technology. The unit is available for 100-125V/11A or 208-230V/4.6A power lines, and is UL and CSA approved. The Heliodont DS and mobile stand have a three-year and one-year warranty, respectively.

### Manufacturer:

Sirona USA  
1200-A Westinghouse Blvd  
Charlotte, NC 28273  
(800) 659-5977  
(704) 587-0453  
(704) 588-4460 FAX  
www.sirona.com

### Suggested Retail Price: \$7,000.00

\$300.00 for installation and training (optional)

### Government Price: \$4,550.00

\$300.00 for installation and training (optional)

### ADVANTAGES:

- + Performed reliably.
- + Easy to operate.
- + Extension arm was stable, easy to position, and provided a wide operating radius.
- + Time settings were easy to read and use.
- + Cone length is appropriate.
- + Has lightweight, low-profile tubehead.
- + Easy to aim tubehead/cone.

- + Rectangular collimator reduces patient radiation exposure.
- + Unit is very stable which prevents tipping.
- + Cord length of remote button was satisfactory.
- + Produced radiographs of acceptable quality.
- + Is compatible for use with digital sensors.
- + Has user-friendly instructions.

**DISADVANTAGES:**

- Unit was difficult to maneuver around the dental chair because the base is heavy and bulky.
- Difficult to correctly position rectangular collimator for long bitewings.

**SUMMARY AND CONCLUSIONS:**

The Heliodont DS Mobile X-ray Unit functioned reliably during the evaluation and produced radiographs of acceptable quality. Its extension arm was easy to position and provided stable positioning for the tubehead. No reports of the unit tipping were received during the evaluation. The product's main disadvantages were the size and weight of the base, which made the unit difficult to maneuver around the dental chair. The **Heliodont DS Mobile X-ray Unit** is rated **Acceptable** for use by the federal dental services.

(Col Bartoloni)

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**64-21 Midmark/Ritter 354 Minor Surgery Spotlight**

**(Project 01-23)**

The Midmark/Ritter 354 Minor Surgery Spotlight is designed to provide an intense light source for surgical procedures. It is advertised as offering counterbalanced, drift-free positioning that requires only two and a half pounds of force to position. The surgical spotlight features an adjustable (from three to ten inches) light-pattern diameter at a 36-inch focal length. It contains a fan-cooled, 150-watt halogen lamp that is described as having a color temperature of 4200° Kelvin and producing an illumination of 43,000 lux at a 36-inch focal length. The light is said to have earned CE, Canadian, and Underwriters Laboratory certification and is compatible with a 120 VAC, 60 Hz electrical supply. It is available for both single- and dual-ceiling mounting to eight- and nine-foot ceilings and is also available as a mobile, floor-mounted light. DIS evaluated only the mobile configuration.

**Manufacturer:**

Midmark Corporation  
60 Vista Drive  
P.O. Box 286  
Versailles OH 45380-0286  
(800) 643-6275  
(937) 526-3662  
(800) 365-8631 FAX  
www.midmark.com

**Suggested Retail Price:** \$2137.00

**Government Price:** \$1206.66

**ADVANTAGES:**

- + Provides excellent illumination for surgical procedures.
- + Esthetic, compact design.
- + Bulb is easy to remove and replace.
- + Controls are easy to reach.
- + Light intensity and light pattern diameter can be adjusted.

- + Integral infrared filter reduces radiant heat production and limits infrared emission.
- + Meets International Standard 9680 requirements for radiant heat production.
- + Meets International Standard 9680 requirements for shadow production.
- + Meets all electrical safety requirements.
- + One-year warranty (except for the bulb).
- + Installation and operation manual is well organized and complete.
- + Cost is comparable to that of dental operator lights presently in use.

**DISADVANTAGES:**

- Light intensity at brightest illumination levels may cause eye fatigue during long procedures.
- Instructions that caution the spotlight is “not for use in oxygen-rich atmospheres” is ambiguous.
- Mobile configuration is difficult to maneuver in traditional dental treatment rooms.

**SUMMARY AND CONCLUSIONS:**

The Midmark/Ritter 354 Minor Surgery Spotlight is a high-intensity light designed to provide illumination for oral surgery procedures. The spotlight was found to produce an illuminance level approximately four times the level usually observed with dental operator lights. Furthermore, the well-focused and sharp light pattern is adjustable from a 3- to 10-inch diameter. The spotlight met electrical safety requirements as well as most of the items from the Medical Procurement Item Description #2 for dental operator lights. The surgical spotlight also met international standards for radiant heat production and shadow pattern. Oral surgeons found the light to be compact, esthetic, and stable. In addition, they noted that it produced illuminance that was vastly superior to that usually produced by dental operator lights. The evaluators unanimously rated the surgical spotlight as above average and the USAF Surgeon General's Consultant for Oral and Maxillofacial Surgery thought that the light should be considered for all oral surgery treatment areas. The cost of the ceiling-mounted unit is comparable to that of the type of ceiling-mounted dental operator light commonly used in USAF oral surgery clinics. The **Midmark/Ritter 354 Minor Surgery Spotlight** is rated **Recommended** for use by the federal dental services.

(Lt Col Roberts)

**64-22 Synopsis of Recently Evaluated One-Step Self-Etching Dentin Bonding Agents (Project 01-67)**

Adhesive materials, especially dentin bonding agents, continue to be the most rapidly changing ones in dentistry. Many new products are introduced each year and, as a result, it becomes difficult to keep track of the type of bonding agent they are and of their clinical indications. The most recently-developed products have been those that use a single solution to treat the enamel and dentin prior to bonding. These products etch, prime, and bond all with one liquid and are most descriptively termed the “One-Step Self-Etching Dentin Bonding Agents.” DIS has recently completed evaluations of three of these products: Prompt L-Pop (3M ESPE), One-Up Bond F (Tokuyama/J. Morita USA), and Touch & Bond (Parkell). To make it easier for you to compare them, information obtained during their individual evaluations has been compiled and entered into a single Table (available at the end of this newsletter). Please note that one of the products, Prompt L-Pop, has recently been reformulated and may, as a result, perform differently than the original version. Only information about the original version (the one evaluated by DIS) is presented in the table.

(Col Charlton)

**64-23 VersaLux™ Cordless Curing Light (Project 01-36)**

The VersaLux™ Cordless Curing Light uses focused Light Emitting Diode (LED) technology to polymerize visible-light-activated materials. Compared to standard halogen bulbs, LED units use semiconductors, in most cases gallium nitride, to produce a more narrow spectral range that is closer to the absorption

spectrum of the camphorquinones that initiate resin polymerization. Due to the combination of this more specific spectral range and the LED's superior energy conversion rate (compared to halogen lamps), the VersaLux™ is purported to generate sufficient intensity for polymerization by using rechargeable Ni-MH (Nickel-Metal-Halide) batteries rather than line voltage. Without bulky power units and cords, the VersaLux™ is portable, lightweight, and very convenient to use. The manufacturer, Centrix®, claims that thirty-five 40-second exposures are possible before the battery needs to be recharged, and six hours are required to fully charge a completely discharged battery. Two batteries are included so that one can be recharging while the other one is in use. The VersaLux™ is supplied with a rotatable, autoclavable, 8-mm-diameter, curved curing tip. Since the curing light does not require a cooling fan, the entire unit can be barrier protected without the danger of restricting airflow, which is a concern in curing lights that contain cooling fans. Light activation and timer programming is accomplished using the same button that is located on the unit. Exposure times can be set from 5 to 65 seconds in 5-second increments. The VersaLux™ Cordless Curing Light is 8.6 inches long by 1.4 inches in diameter and weighs 5.3 oz. The charging unit is available in both 120V and 220V models and is CE certified.

**Manufacturer:**

Centrix, Inc.  
770 River Road  
Shelton, CT 06484  
(800) 235-5862  
(203) 929-5582  
(203) 944-2872 FAX  
www.centrixdental.com

**Suggested Retail Price:**

\$1495.95 VersaLux™ Cordless Curing Light, includes:

- handpiece
- autoclavable/rotatable 8-mm-diameter curing tip
- battery charger
- two rechargeable Ni-MH batteries
- depth-of-cure testing block
- instruction manual.

**Government Price:**

\$999.95 VersaLux™ Cordless Curing Light (items included are same as listed above)

**ADVANTAGES:**

- + Offers the conveniences of portability and light weight.
- + Maintained constant irradiance for a minimum of thirty-five, 40-second exposures.
- + Curing tip swivels 360 degrees to facilitate intraoral access.
- + Very quiet.
- + Requires little counter space for storage.
- + Generates very little heat from tip during use.
- + Provided with two rechargeable batteries.
- + CE marked.

**DISADVANTAGES:**

- Does not adequately cure resin composites using the resin composite manufacturer's recommended exposure times.
- Required more time than a halogen light unit to adequately polymerize resin composites.
- Procedures for setting exposure time and light activation are not intuitive.
- More expensive than halogen curing lights.
- No blue-light eye protective devices were provided.

- Unit became warm and irradiance level dropped when used for more than five consecutive 40-second exposures.

**SUMMARY AND CONCLUSIONS:**

The VersaLux™ Cordless Curing Light is a lightweight, portable curing light that uses the latest Light Emitting Diode (LED) technology. Clinical evaluators appreciated its portability and convenience, however they reported that the programming and activation procedures were confusing and not intuitive. The Nickel-Metal-Hydrate battery effectively provided consistent output for thirty-five, 40-second exposures without needing to be recharged. Unfortunately, if the light was activated more than five times in succession, the barrel became warm and the output dropped. Allowing the light to cool for ten minutes returned the light to its original irradiance level. DIS testing found that the VersaLux™ Cordless Curing Light did not adequately polymerize the resin composites used in the evaluation in the amount of time called for by the resin composites' manufacturers when curing with a standard halogen light. In the product instructions, the user is instructed to test his/her particular brand of resin composite for depth-of-cure using a provided test block. This means of testing depth-of-cure (scrape test) has been shown to overestimate depth-of-cure. When using a halogen light, 40 seconds are required for a standard hybrid resin composite and 60 seconds for a microfill resin composite to adequately cure a 2-mm-thick increment. DIS testing found that the VersaLux™ required 61 seconds and 131 seconds to polymerize a hybrid composite (Z-100) and a microfill composite (Silux Plus), respectively. The **VersaLux™ Cordless Curing Light** is rated **Marginal** for use by the federal dental services.

(Col Leonard)

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**64-24 Bingo-1020 Apex Locator**

**(Project 01-30)**

The Bingo-1020 Apex Locator (AL) from Dent Corp is a portable, microprocessor-controlled, endodontic apex locator. The unit uses two connectors to obtain its measurements: one attached to a clip placed on the patient's lip and the other attached to an endodontic file. The Dent Corporation claims that the apex locator is capable of measuring in 0.1-mm increments and operates accurately regardless of root canal condition (e.g. dry, or wet with blood, purulence, etc.). The Bingo uses a proprietary algorithm called Root Wizard to track and display the file's position on a 3¼"W X 2"H liquid crystal screen that has five different display modes (for close-up view of the display, click here). Notably, the unit can also display an enlarged apex view that shows the file tip's location relative to the root end. Audible signals sound as the apex is approached, and a warning tone combined with a red visual reading indicates an overinstrumented apex. The Bingo is 6¼"L X 3¼"W X 1 d"H and weighs 9½ oz. A foldable plastic support on the back of the Bingo allows the provider to position the unit at three different angles to facilitate viewing.

**Manufacturer:**

Dent Corp  
7-11 South Broadway  
White Plains, NY 10601  
(800) 454-9244  
(914) 682-6600  
(914) 948-1711 FAX  
www.dentcorp.com

**Suggested Retail Price:**

\$799.00 Bingo-1020 Apex Locator (item no. 1020), contains:  
-Bingo unit  
-patient lip clip  
-endodontic file clip  
-instructional/operation manual

**Government Price:**

\$639.00 Bingo-1020 Apex Locator (item number and contents as listed above)

**ADVANTAGES:**

- + Excellent auditory and visual cues.
- + Extremely simple to use.
- + No calibration required prior to use.
- + Foolproof cord connections.
- + Measurements were found to be very accurate when the device was operating consistently.
- + Very accurate with straight anterior teeth.
- + Facilitated pain-free treatment while determining apex location.
- + Can use either 3.6-volt NiMH or NiCd battery.
- + Small size facilitates cleaning, storage, and increases portability of the unit.
- + Minimal learning time required to operate unit.
- + Less expensive than some other currently available models.
- + Easy to sanitize.

**DISADVANTAGES:**

- Erratic and unreliable readings were frequently reported.
- Gave unreliable readings when used in a dry canal.
- After the "low battery" indicator light comes on, readings are very inconsistent.
- No trouble-shooting guide is provided with unit.
- Instructions for use and for tutor mode are inconsistent.
- Battery specified in user manual did not match battery in unit.
- Replacement batteries may be difficult to locate.
- Small size and light weight could allow unit to be pulled off stand while in use.

**SUMMARY AND CONCLUSIONS:**

The Bingo-1020 Apex Locator received mixed results from the clinical-user testing. One user would purchase the unit, while the other would not. Instructions for use were found to be inconsistent. One provider had to frequently verify readings with radiographs because readings were inconsistent (i.e., erratic) in tight-curved spaces and in teeth that had cast crowns or large amalgam restoration. However, when the unit provided consistent readings, they were found to be extremely accurate. Consistent readings were most often reported on anterior teeth. The Bingo AL is extremely simple to use and requires no calibration prior to use. **The Bingo-1020 Apex Locator** is rated **Acceptable** for use by the federal dental services.

(MSgt Belde)

# LABORATORY

**64-25 Talon Acrylic****(Project 01-24)**

Talon is a thermoplastic, resilient acrylic recommended by its manufacturer for the fabrication of conventional acrylic interocclusal appliances. Its uses include the intaglio surface of nightguards, as well as sleep apnea appliances, sports guards, obturators, orthodontic appliances, surgical stents, and splints. It is a methacrylate, which is purported to have no leachable chemical plasticizers and which forms an inseparable bond with other methyl methacrylates. The thermoplastic properties of Talon allow it to be rigid at room temperature to facilitate finishing and polishing but flexible at intraoral temperature. Its flexibility is

said to account for its ability to flex into undercuts with minimal or no blockout required on the master cast. The Talon technique involves waxing up the appliance and then investing it with either hydrocolloid or gypsum using a flask provided by the manufacturer. After boilout and wax removal, the premixed Talon is then injected into the mold using a gun and cured at 145° F or 165° F (depending on the technique), at 20 psi for 2 hours, plus 15 minutes per flask. The cured Talon appliance is deflasked, removed from the cast while warm, then cooled until rigid for finishing. Talon is supplied premixed in a 6-oz or 12-oz tube and must be stored at a temperature below 38° (i.e., in a freezer). A technique package can be purchased from the manufacturer, which includes Talon acrylic, injection gun, and flask. Available at no charge is a training video demonstrating both the gypsum and hydrocolloid techniques.

**Manufacturer:**

Comfort Acrylics, Inc.  
 2103 N.E. 272<sup>nd</sup> Avenue  
 Camas, WA 98607  
 (360) 834-9218  
 (800) 748-2566  
 www.comfortacrylics.com

**Suggested Retail and Government Prices:**

Item	Retail Price	Government Price
Technique Package, includes 6-oz tube of polymer, injection system, and flask	\$231.95	\$208.76
Technique Package, includes 12-oz tube of polymer, injection system, and flask	\$309.95	\$278.96
6-oz tube of Talon Polymer	\$114.00	\$102.60
12-oz tube of Talon Polymer	\$180.00	\$162.00

**ADVANTAGES:**

- + Patients reported greater comfort with Talon-fabricated appliances than with standard methacrylate ones.
- + Shortens insertion time.
- + Easy to dispense.
- + No mixing required.
- + Minimal or no cast blockout required.
- + Easy to contour and finish when chilled.
- + Appliances fabricated with it provide good intraoral retention.

**DISADVANTAGES:**

- Requires longer time for fabrication than standard procedures used for non-thermoplastic acrylics.
- Pressure pot used to cure Talon requires a temperature control.
- The 12-oz tube of Talon does not fit upright in a smaller freezer.

**SUMMARY AND CONCLUSIONS:**

Talon is a premixed, thermoplastic acrylic that is dispensed with an easy-to-use injection gun. When used to make nightguards, the manufacturer's technique of wax-up, flask, boilout, and processing requires more time than conventional nightguard processing techniques. However, the thermoplastic resiliency of Talon eliminates the need for survey and blockout of the master cast, because the material flexes into undercuts when warmed prior to insertion. Talon was found to reduce insertion times by an average of 10 to 15 minutes compared to conventional hard acrylics. Even though additional time may be necessary for fabrication, Talon was found to provide good clinical adaptation and patient comfort. **Talon Acrylic** is rated

Acceptable for use by the federal dental services.

(MSgt Osborn)

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## 64-26 Impak Acrylic

(Project 01-25)

Impak is a clear or pink-fibered, thermoplastic acrylic that was originally developed in the 1960s for sport mouthguards. Currently it is also indicated for nightguards, sleep apnea appliances, orthodontic retainers, surgical splints, and dentures. Impak is packaged as a powder and ethyl methacrylate monomer which, at the time of use, are mixed and then heat cured at 165° F for five hours. Impak is prepared and processed using procedures similar to those used for conventional heat cured denture acrylics (wax-up, flasking, boilout, and packing). The manufacturer claims that it bonds to traditional methyl methacrylate acrylics. Impak is said to be stiff or rigid when cold, but soft and pliable at intraoral temperatures. Because of this, appliances made of Impak purportedly have advantages over those made with traditional acrylics, such as greater patient comfort and minimal need for cast blockout. It's manufacturer also claims that decreasing the powder/ liquid ratio results in a softer appliance and increasing the powder/ liquid ratio results in a stiffer appliance. Impak is available in a set of one pound of powder and 11 ounces of liquid or six pounds of powder and 64 ounces of liquid. However, powder and liquid can be purchased separately. Pink-fibered powder is also available for use with complete or removable partial dentures. A technique manual for the fabrication of nightguard, and sleep apnea appliances is available from the manufacturer upon request.

### Manufacturer:

Vernon-Benshoff Company  
413 North Pearl Street  
Albany, NY 12207  
(800) 833-2343  
(518) 434-3147  
(518) 434-1288 FAX  
www.vernon-benshoff.com

### Suggested Retail and Government Prices:

Item	Retail Price	Government Price
Set of Clear (1 lb. of powder and 11 oz. of liquid)	\$54.00	\$48.60
Set of Clear (6 lb. of powder and 64 oz. of liquid)	\$209.00	\$188.10
Set of Pink Fibered (1 lb. of powder and 11 oz. of liquid)	\$65.00	\$58.50
Set of Pink Fibered (6 lb. of powder and 64 oz. of liquid)	\$250.00	\$225.00

### ADVANTAGES:

- + Increased patient comfort compared to traditional hard acrylics.
- + Minimizes the need for cast blockout during fabrication.
- + Bonds well to conventional acrylics.
- + Polishes easily when cold.
- + Makes it quicker to insert appliances.

### DISADVANTAGES:

- Labor-intensive process for laboratory personnel.
- Technique sensitive to work with.
- Is cloudy after processing; must dry thoroughly to become clear.
- More time-consuming than other nightguard techniques.

- Not shipped with MSDS.
- Comprehensive instruction booklet must be requested from manufacturer.

**SUMMARY AND CONCLUSIONS:**

Impak was well accepted by patients and providers for its fit and comfort. Laboratory technicians found the Impak technique required 1 to 2 more hours of fabrication time than existing nightguard fabrication techniques. The Impak technique includes the wax-up, flask, boilout, split-pack with hard acrylic, and curing procedures to fabricate a nightguard. After curing, the material is cloudy and must be allowed to dry completely to turn clear. The resiliency of the Impak material at intraoral temperatures allows nightguards to be fabricated with only major undercuts blocked out. Although more time is necessary when fabricating appliances with Impak, the material's resiliency results in a more comfortable appliance. **Impak Acrylic** is rated **Acceptable** for use by the federal dental services.

(MSgt Osborn)

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**64-27 Easy Tray**

**(Project 01-15)**

Easy Tray is a thermoplastic tray material manufactured by the Kerr Corporation. Easy Tray is marketed as a quick, chemical-free alternative to conventional acrylic monomer/polymer used for custom tray fabrication. It is also purported to have several other uses, including bite registrations, temporary crown forms, facebow transfer registrations, and the protection of teeth during extraction. To use Easy Tray, it is first softened by immersing it in 170° F (or warmer) water for 15 to 20 seconds. It is then formed either directly in the mouth or on a cast. While still warm, the material can be trimmed with scissors, adapted further, and then smoothed with fingers. When cooled, the material becomes rigid, and it can reportedly be lightly trimmed with a carbide bur. Easy Tray can be resoftened at any time if the material needs to be further manipulated. The material is 3-mm thick and is supplied in a box of 20 preshaped wafers for the maxillary or the mandibular arch.

**Manufacturer:**

Kerr Lab  
1717 W. Collins Avenue  
Orange, CA 92867  
(800) 537-7187  
(714) 516-7650  
(800) 537-7345 FAX  
www.kerrlab.com

**Suggested Retail Price:**

\$73.50 Upper tray, box of 20 (item no. 29417)  
\$73.50 Lower tray, box of 20 (item no. 29418)

**Government Price:**

\$41.80 Upper tray, box of 20 (item no. 29417)  
\$41.80 Lower tray, box of 20 (item no. 29418)

**ADVANTAGES:**

- + Simply to use.
- + Can be used to make custom trays in much less time than conventional methacrylate products.
- + Has no objectionable odor.
- + Contains no hazardous chemicals.
- + Is easy to contour and smooth when warm.

**DISADVANTAGES:**

- Less rigid than light-cured or auto-cured methacrylate materials.
- Is not easily cut with a knife when warm.
- Carbide burs clog during trimming of hardened material.

**SUMMARY AND CONCLUSIONS:**

Easy Tray is a thermoplastic material that is very simple to use and eliminates the use of methacrylate chemicals for custom impression tray fabrication. Custom trays can be fabricated in less than five minutes and require only the use of warm water (i.e., 170° F or higher) and scissors. Although the warmed material is difficult to cut with a knife blade, it can easily be cut with scissors. Borders can then be smoothed with a finger. Carbide burs clog quickly when trimming the material after it has cooled. Custom trays made with Easy Tray do not have the rigidity of trays made with conventional auto-cured or light-cured materials. The cost of Easy Tray is comparable to most other light-cured or auto-cure methacrylate tray materials on the market. **Easy Tray** is rated **Acceptable** for use by the federal dental services.

(MSgt Osborn)

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**64-28 Synopsis of Steam Cleaners****(Project 01-33)**

Steam cleaners are an important piece of equipment in dental laboratories. They offer a quick, efficient way of cleaning porcelain, metal, dentures, and casts during the prosthesis-fabrication process. Because of advances in technology, the heavy cumbersome steam cleaners of the past that had exposed pipe fittings have given way to more efficient, compact, and attractive models. Having a good, reliable steam cleaner in your laboratory helps to increase productivity.

There are several factors to consider when replacing your current steam cleaner or purchasing one for the first time. The first factor is the capacity of the water reservoir. Ideally, after being filled and turned on in the morning, the steam cleaner should last throughout the day without needing to be refilled. As a rule of thumb, units with a water reservoir capacity of ½ gallon or less work well in laboratories with fewer than 6 people. Larger dental laboratories should consider a unit with a capacity that is greater than ½ gallon. Units with a capacity of over 1½ gallons or ones with a continuous water-feed feature work well in high-production areas or military area dental laboratories. Other features that should be considered include the unit's ability to generate wet and/or dry steam, its steam pressure adjustment features, and the type of steam nozzle it has (e.g., hand-held or built-in). For most dental laboratory work such as removing wax, polishing residue, and disclosing media, wet steam works best. Having the ability to adjust the unit's steam pressure level can be advantageous when cleaning restorations such as porcelain veneers where lower pressure can reduce the risk of damage. A built-in steam nozzle positioned over a sink gives the operator the freedom of using both hands and it also helps to limit overspray. On the other hand, a hand-held spray nozzle allows more freedom of movement, but it does not contain overspray as well. Also, hand-held nozzles have a tendency to build up condensate in the hose, which is expelled from the nozzle before the steam.

Other important factors that can help you choose the proper steam cleaner for your laboratory include the composition of the water reservoir and location of the heating element. Units that have a water reservoir that is stainless steel with the heating element wrapped around the outside of the reservoir require the least maintenance and may not require the use of distilled water. Because of its composition, a stainless steel reservoir is practically immune to rust and corrosion and, therefore, maintenance of these steam cleaners usually only requires periodic water flushing to clean out sediment in the tank. Units with the heating element on the inside of the water reservoir generally require the use of distilled water and may need cleaning with a chemical periodically to prevent mineral build-up or corrosion of the heating element. The location of the heating element should not affect the service life of the machine, however, as long as proper maintenance is performed. The location of the heating element was not included in our synopsis table, but can be determined by contacting the manufacturer.

The synopsis consists of four tables at the end of this newsletter. Each table provides pertinent information for the listed steam cleaners and should make it much easier for you to select a unit that will meet your needs. Please contact the appropriate manufacturer for information not included in the tables.

(MSgt Osborn)

## INFECTION CONTROL

### 64-29 LARK Retractable Safety Scalpel

(Project 00-46)

The LARK Retractable Safety Scalpel is a disposable plastic scalpel handle with self-contained stainless-steel blade that is designed to protect healthcare workers from accidental percutaneous injuries that can occur when using conventional scalpels. The LARK's blade is extended forward and locked into position by depressing the side of the plastic handle and sliding it forward. After use, the blade is retracted by depressing a specific spot on the handle, which causes a spring to withdraw the blade into the handle housing. The manufacturer claims that the handle is well balanced and compact. The handle is 5¾ inches long (with blade extended), ½ inch wide, and ¼ inch thick, and it weighs 0.22 ounces. The product is completely disposable, is available in blade sizes 10, 11, and 15, and comes 20 per box.

**Manufacturer:**

Futura Medical Corporation  
380 Stevens Avenue  
Solana Beach, CA 92075  
(800) 631-0076  
(858) 350-0130  
(858) 350-0135 FAX  
www.futuramedical.com

**Suggested Retail Price:**

\$40.00 Box of 20

**Government Price:**

\$20.00 Box of 20

**ADVANTAGES:**

- + Safer for the operator than conventional scalpels because it minimizes the risk of percutaneous injuries.
- + Safer for patient than conventional scalpels because the blade can remain retracted until needed.
- + Conveniently packaged.
- + Lightweight and well balanced.
- + Safety feature is easy to recognize and use.
- + Safety feature can be activated with one hand.
- + Enhances infection control because of its disposability.

**DISADVANTAGES:**

- Handle is bulky.
- Blade can inadvertently be retracted when making incisions.

**SUMMARY AND CONCLUSIONS:**

The LARK Retractable Safety Scalpel is designed to protect healthcare workers from surgical blade

injuries. The operator can easily control the blade position so it can be extended only during use. This safety feature offers tactile and audible feedback, and can be performed using one hand which minimizes the potential for percutaneous injury. The scalpel performed reliably during the evaluation, and the evaluators felt its design would reduce percutaneous injuries. The main disadvantages noted were bulkiness of the handle, and the potential for users to activate the safety feature inadvertently during use. Prior to purchasing, buyers should consider the cost/benefit ratio of this product compared to reusable metal scalpel handles and disposable blades. The **LARK Retractable Safety Scalpel** is rated **Acceptable** for use by the federal dental services.

(Col Bartoloni)

## Synopsis of Recently Evaluated One-Step Self-Etching Dentin Bonding Agents

Product	Prompt L-Pop	One-Up Bond F	Touch & Bond
<b>Manufacturer</b>	ESPE America 1710 Romano Drive P.O. Box 111 Norristown, PA 19404-0111 (800) 344-8235 (610) 277-3800 (800) 458-3987 FAX www.espeusa.com	Tokuyama Company Distributor: J Morita USA 9 Mason Irvine, CA 92618 (888) 566-7482 (949) 581-9600 (949) 465-1095 FAX www.jmoritausa.com	Parkell 155 Schmitt Blvd PO Box 376 Farmingdale, NY 11735 (800) 243-7446 (631) 249-1134 (631) 249-1242 FAX www.parkell.com
<b>Recommended Uses</b>	bonding directly-placed, VLA resin composites and compomers; bonding when sealing fissures and attaching orthodontic brackets	bonding directly-placed resin composites; sealing exposed cervical dentin and root surfaces	bonding directly-placed resin composites
<b>Kit Contents</b>	one hundred (100) 0.12-mL L-Pops	one 5-mL Bottle A; one 5-mL Bottle B; accessories (e.g., brush handle, disposable tips, mixing dish)	one 5.5-mL bottle of liquid; 175 activator pledgets; 50 microbrushes; organizer tray
<b>Components</b>	In blister pack: <u>compartment 1</u> : methacrylated phosphoric acid esters, photoinitiator, stabilizers <u>compartment 2</u> : water, fluoride complex, stabilizers <u>compartment 3</u> : microbrush	<u>Bottle A</u> : adhesion-promoting monomer (MAC-10), methacryloyl-oxyalkyl acid phosphate, Bis-GMA, TEGDMA, photoinitiator <u>Bottle B</u> : HEMA, water, fluoro-alumino-silicate glass filler, photoinitiator	<u>Bottle</u> : 4-META, urethane dimethacrylate, methylmethacrylate, HEMA, acetone <u>pledgets</u> : impregnated with sodium p-toluenesulfinate (a co-initiator)
<b>Method of Activation</b>	visible light cured	visible light cured	visible light cured
<b>Shear Bond Strength to Dentin in DIS Testing (Mean ± st dev)</b>	7.1 ± 4.0 MPa	23.3 ± 3.5 MPa	13.5 ± 5.2 MPa
<b>Application Time (seconds) in DIS Testing</b>	33: without VLA 45: with VLA	51	71
<b>Retail Price</b>	\$159.00	\$109.00	\$96.00
<b>Government Price</b>	\$103.35	\$76.30	\$96.00
<b>DIS Rating</b>	Marginal (DIS 61-20)	Acceptable (DIS 62-14)	Acceptable (DIS 64-18)

BisGMA = Bis Glycidyl Methacrylate

4-META = 4-methacryloxyethyltrimetallic acid anhydride

HEMA = 2-hydroxyethyl methacrylate

TEGDMA = Triethylene Glycol Dimethacrylate

VLA = visible light activated or visible light activation

### SYNOPSIS OF STEAM CLEANERS (1 OF 4)

<b>Product/Model</b>	CL 2010 *GP	CL 2000 *GP	CL 2005 *GP	CL 9001 GP
<b>Manufacturer or Distributor</b>	CD Nelson MFG & Supply P.O. Box 726 27421 N. Darrell Road Wauconda, IL 60084 Phone: (847) 487-4870 FAX: (847) 487-4873	CD Nelson MFG & Supply P.O. Box 726 27421 N. Darrell Road Wauconda, IL 60084 Phone: (847) 487-4870 FAX: (847) 487-4873	CD Nelson MFG & Supply P.O. Box 726 27421 N. Darrell Road Wauconda, IL 60084 Phone: (847) 487-4870 FAX: (847) 487-4873	CD Nelson MFG & Supply P.O. Box 726 27421 N. Darrell Road Wauconda, IL 60084 Phone: (847) 487-4870 FAX: (847) 487-4873
<b>Retail Cost</b>	\$659.00	\$1757.00	\$999.00	\$2573.00
<b>Government Cost</b>	\$593.10	\$1581.30	\$899.10	\$2315.70
<b>Dimensions</b>	7.5"W x 10"D x 16"H	9"W x 22"D x 16"H	9"W x 11.75"D x 16"H	21"W x 19"D x 19"H
<b>Steam Pressure</b>	60-80 psi, adjustable	60-80 psi, adjustable	60-80 psi, adjustable	60-80 psi, adjustable
<b>Self-Contained or Continuous Water Source</b>	Self-contained. Continuous is optional.	Self-contained. Continuous is optional.	Self-contained. Continuous is optional.	Self-contained. Continuous is optional.
<b>Self-Contained Water Source Capacity</b>	1.4 gal	4.4 gal	2.3 gal	6 gal
<b>Steam Chamber Material</b>	Stainless steel	Stainless steel	Stainless steel	Glass-lined porcelain
<b>Voltage</b>	110v or 220v	110v or 220v	110v or 220v	110v or 220v
<b>Adjustable Thermostat</b>	Yes	Yes	Yes	Yes
<b>Wet or Dry Steam</b>	Both	Both	Both	Both
<b>Built-in or Hand-held Steam Nozzle</b>	Built-in. Hand-held is optional.	Built-in. Hand-held is optional.	Built-in. Hand-held is optional.	Built-in. Hand-held is optional.
<b>Foot Pedal Included</b>	Yes	Yes	Yes	Yes
<b>Low Water or Built-in Water Level Indicator</b>	Low water indicator. Built-in indicator is optional.			
<b>Auto Shut-off</b>	Optional	Optional	Optional	Optional
<b>Safety Features</b>	All enclosed components. Energy efficient insulation. Automatic check valve.			

### SYNOPSIS OF STEAM CLEANERS (2 OF 4)

<b>Product/Model</b>	Emmevi VAP 6-A	Emmevi VAP 6	Emmevi Aqua	Steaman Constant
<b>Manufacturer or Distributor</b>	Harris Discount Supply 7505 W. Melrose Lane STE. A Oklahoma City, OK 73127 Phone: (800) 227-8524	Harris Discount Supply 7505 W. Melrose Lane STE. A Oklahoma City, OK 73127 Phone: (800) 227-8524	Harris Discount Supply 7505 W. Melrose Lane STE. A Oklahoma City, OK 73127 Phone: (800) 227-8524	Bar Instruments 1441 Pleasant Oaks Place Thousand Oaks, CA 91362 Phone: (805) 496-5401 FAX: (805) 486-3929
<b>Retail Cost</b>	\$1795.00 + shipping	\$1449.00 + shipping	\$689.00 + shipping	\$1300.00
<b>Government Cost</b>	\$1795.00 + shipping	\$1449.00 + shipping	\$689.00 + shipping	\$1200.00
<b>Dimensions</b>	11.5"W x18.1"D x 16.5"H	11.5"W x18.1"D x 16.5"H	12"W x 15.75"D x 12"H	14"W x 8"D x 8.5"H
<b>Steam Pressure</b>	6 bars (87psi)	6 bars (87 psi)	5 bars (86 psi)	75 psi
<b>Self-Contained or Continuous Water Source</b>	Continuous	Self-Contained	Self-Contained	Continuous
<b>Self-Contained Water Source Capacity</b>	N/A	2.5 liters (0.7 gal)	3 liters (0.8 gal)	N/A
<b>Steam Chamber Material</b>	Stainless steel	Stainless steel	Stainless steel	Stainless steel
<b>Voltage</b>	110v	110v	115v	110v/60hz
<b>Adjustable Thermostat</b>	No	No	No	Yes
<b>Wet or Dry Steam</b>	Both	Both	Both	Wet
<b>Built-in or Hand-held Steam Nozzle</b>	Hand-held	Hand-held	Hand-held	Hand-held
<b>Foot Pedal Included</b>	No	No	Yes	No
<b>Low Water or Built-in Water Level Indicator</b>	Low Water	Low Water	Both	Both
<b>Auto Shut-off</b>	Yes	Yes	Yes	Yes
<b>Safety Features</b>	European CE certified. Safety pressure switch with resistance inhibition and illuminated indicator. Safety valve.	European CE certified. Safety pressure switch with resistance inhibition and illuminated indicator. Safety valve.	Electronic management of water level and resistance supply. Safety top w/steam discharging & anti-unscrewing system if overpressurized. Internal safety system in case of overheating.	Pressure, heat, and electric monitors for added protection.

### SYNOPSIS OF STEAM CLEANERS (3 OF 4)

<b>Product/Model</b>	Steaman II	Steaman Jr	Green Dragon 15-2000	Silver Dragon 15-100S
<b>Manufacturer or Distributor</b>	Bar Instruments 1441 Pleasant Oaks Place Thousand Oaks, CA 91362 Phone: (805) 496-5401 FAX: (805) 486-3929	Bar Instruments 1441 Pleasant Oaks Place Thousand Oaks, CA 91362 Phone: (805) -496-5401 FAX: (805) 486-3929	Newell MFG Co. 30 East Adams Chicago, IL 60603 Phone: (800) 621-6296 FAX: (312) 236-2231	Newell MFG Co. 30 East Adams Chicago, IL 60603 Phone: (800) 621-6296 FAX: (312) 236-2231
<b>Retail Cost</b>	\$975.00	\$775.00	\$629.00	\$659.00
<b>Government Cost</b>	\$900.00	\$700.00	\$440.30	\$461.30
<b>Dimensions</b>	9"W x 12"D x 9.5"H	8"W x 11"D x 8.5"H	9"W x 12"D x 10"H	9"W x 12"D x 10"H
<b>Steam Pressure</b>	75 psi	75 psi	90-125 psi	90-125 psi
<b>Self-Contained or Continuous Water Source</b>	Self-contained	Self-contained	Outside (i.e., separate) water reservoir	Outside (i.e., separate) water reservoir
<b>Self-Contained Water Source Capacity</b>	0.5 gal	1 quart	N/A	N/A
<b>Steam Chamber Material</b>	Stainless steel	Stainless steel	Aluminum	Aluminum
<b>Voltage</b>	110v/60hz	110v/60hz	110-120v	110-125v
<b>Adjustable Thermostat</b>	Yes	Yes	Yes	Yes
<b>Wet or Dry Steam</b>	Wet	Wet	Dry	Dry
<b>Built-in or Hand-held Steam Nozzle</b>	Hand-held	Hand-held	Built-in. Hand-held is available.	Built-in. Hand-held is available.
<b>Foot Pedal Included</b>	No	No	Yes	Yes
<b>Low Water or Built-in Water Level Indicator</b>	Both	Both	No	No
<b>Auto Shut-off</b>	Yes	Yes	Yes	Yes
<b>Safety Features</b>	Pressure, heat, and electric monitors for added protection.	Pressure, heat, and electric monitors for added protection.	Blow-off valve. Thermo-fuse relay cutoff. UL & CE listed.	Blow-off valve. Thermo-fuse relay cutoff. UL & CE listed.

### SYNOPSIS OF STEAM CLEANERS (4 OF 4)

<b>Product/Model</b>	Steam Dragon 15-100FP	Portable Steamer	Steam Cleaner Model 24,900 (110v) Model 24,900x (220v)	Triton SL
<b>Manufacturer or Distributor</b>	Newell MFG Co. 30 East Adams Chicago, IL 60603 Phone: (800) 621-6296 FAX: (312) 236-2231	Kerrlab 1717 W. Collins Orange, CA 92867 Phone: (800) 537-7187 FAX: (800) 537-7345	Grobet USA 750 Washington Ave. Carlstadt, NJ 07072 Phone: (888) 447-6238 Fax: (800) 243-2432	BEGO USA Inc. 90 Douglas Pike, STE 2 Smithfield, RI 02917 Phone: (800) 342-2346 FAX: (401) 232-3238
<b>Retail Cost</b>	\$769.00	\$1499.95	NA	\$2995.00
<b>Government Cost</b>	\$538.30	\$799.92	\$890.00 – 110 volt \$920.00 – 220 volt	\$2546.00
<b>Dimensions</b>	15"W x 12"D x 11"H	7"W x 12"D x 13"H	14.5"W x 10.5"D x 14"H	15"W x 11"D x 22"H
<b>Steam Pressure</b>	90-125 psi	60 psi, adjustable	70–80 psi	45-60 psi
<b>Self-Contained or Continuous Water Source</b>	Self-contained; has outside, separate water reservoir	Self-contained	Self-contained	Continuous
<b>Self-Contained Water Source Capacity</b>	N/A	0.5 gal	2.3 gal	N/A
<b>Steam Chamber Material</b>	Aluminum	Stainless steel	Rolled steel	Stainless steel
<b>Voltage</b>	110-120v or 220-240v	110-120v	110 volt or 220 volt	110 volt
<b>Adjustable Thermostat</b>	Yes	No	Yes	No
<b>Wet or Dry Steam</b>	Dry	Wet	Both	Both
<b>Built-in or Hand-held Steam Nozzle</b>	Built-in. Hand-held available.	Hand-held	Built-I	Hand-held
<b>Foot Pedal Included</b>	Yes	No	Yes	No
<b>Low Water or Built-in Water Level Indicator</b>	No	Both	Both	Both
<b>Auto Shut-off</b>	Yes	Yes. Heater shuts off when water level is too low.	Yes. Shuts off when water level is too low.	Yes
<b>Safety Features</b>	Blow-off valve. Thermo-fuse relay cutoff. UL & CE listed.	Audible low-water indicator. May only be filled when there is no pressure in the unit.		Water leak detector. Locking lid. If operating pressure is exceeded, water and heater shut off.